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Joint Printing Committee Opens Paper Bids

Forty-five Bidders Submit Proposals For Supplying Government Printing Office With Paper For the Three-Month Period Beginning January 1 — Bids Are Generally Higher Than At Last Opening.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 13, 1943.—The Joint Congressional Committee on Printing received 45 bids today for 61,115,000 pounds of paper for the use of the Government Printing Office for the three months period beginning January 1. The bids were generally higher than those received at the last opening on September 21. The Committee expects to meet December 21 to consider making awards. The bids were as follows:

Newsprint

No. 1—2,500,000 lbs., 24x36—64; rolls, 19, 24, 36 and 48 ins. wide (3-inch fiber cores, weight of cores and wrappers shall be included in net weight).

Marquette Paper Corp.
(600,000 lbs. only) 2.95c

Telephone Book News

No. 2—100,000 lbs., 24x36—45; rolls, 28 and 38 ins. wide (3-inch fiber cores). (Weight of cores and wrappers shall be included in the net weight.)

D. L. Ward Paper Co. 5.68c

Machine-Finish Book

No. 3—250,000 lbs., 25x38—70; flat, cut 22½x31, and 31¼x45½ in.

No bids

No. 4—400,000 lbs., 25x38—70; flat, cut 24x38, and 38x48 ins.

Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. for lots 4, 5, 6, 7, 8, 9 and 10) 7.90c

No. 5—400,000 lbs., 25x38—70; flat, cut 24x38, and 38x48 ins.

Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. for lots 4, 5, 6, 7, 8, 9 and 10) 7.90c

No. 6—500,000 lbs., 25x38—70; rolls, 28½ ins. wide (3-inch fiber cores).

Mudge Paper Co.
(300,000 lbs. only) 7.49c
Marquette Paper Corp. 7.49c
Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. Lots 4, 5, 6, 7, 8, 9 and 10) 7.50c
Allied Paper Mills. 7.53c
Mead Sales Co. 7.59c

No. 7—500,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).

Mudge Paper Co.
(300,000 lbs. only) 7.49c
Paper Corp. of U. S. 7.28c
Marquette Paper Corp. 7.19c
Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. Lots 4, 5, 6, 7, 8, 9 and 10) 7.50c
Allied Paper Mills.
(300,000 lbs. only) 7.30c

No. 8—500,000 lbs., 25x38—70; rolls, 19 and 38 ins. wide (3-inch fiber cores).

Mudge Paper Co.
(300,000 lbs. only) 7.49c
Paper Corp. of U. S. 7.28c
Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. Lots 4, 5, 6, 7, 8, 9 and 10) 7.50c

No. 9—500,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide (3-inch fiber cores).

Mudge Paper Co.
(300,000 lbs. only) 7.49c
Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. Lots 4, 5, 6, 7, 8, 9 and 10) 7.50c
Allied Paper Mills. 7.30c

No. 10—200,000 lbs., 25x38—90; flat, cut 38x48 and 41x52 ins.

Barton, Duer & Koch Paper Co. (Aggregate of 1,500,000 lbs. Lots 4, 5, 6, 7, 8, 9 and 10) 6.90c
Mead Sales Co. 6.94c
Stanford Paper Co. 6.93c

Machine-Finish Book End Paper

No. 18—60,000 lbs., for waste leaves; flat, cut 25x38—160; the grain to run the 38-inch way.

Wilcox, Walter, Furlong Paper Co. 7.39c

Offset Book

No. 19—1,000,000 lbs., 25x38—80; flat, cut 38x48 ins., the grain to run lengthwise of the sheet.

Paper Corp. of U. S.
(500,000 lbs. only) 8.69c
Central Ohio Paper Co.
(750,000 lbs. only) 8.52c
Marquette Paper Corp. 8.70c
Aetna Paper Co.
(100,000 lbs. only) 8.68c

No. 20—50,000 lbs., 25x38—90; flat, cut 34x44 ins., the grain to run lengthwise of the sheet.

Aetna Paper Co. 8.12c

No. 21—2,000,000 lbs., 25x38—100 and 120; flat, cut 38x48 ins., grain to run lengthwise of the sheet.

R. P. Andrews Paper Co.
(500,000 lbs. only) 7.49c
Paper Corp. of U. S.
(500,000 lbs. only) 7.56c
Whitaker Paper Co.
(400,000 lbs. only) 7.42c
Aetna Paper Co.
(100,000 lbs. only) 7.56c

Antique Book

No. 22—150,000 lbs., 25x38—100; flat, cut 38x50 ins.

Swigart Paper Co. 6.93c
Central Ohio Paper Co. 7.17c
Whitaker Paper Co. 7.21c
Allied Paper Mills. 7.09c
Stanford Paper Co. 7.17c
Wilcox, Walter, Furlong Paper Co. 7.1[illegible]

Lightweight Machine Finish Book

No. 23—40,000 lbs., 25x38—60; flat, cut 38x48 ins.

Allied Paper Mills. 8.55c

50 Per Cent Lightweight Machine-Finish Book

No. 24—36,000 lbs., 25x38—60; flat, cut 38x48 ins. Min. order 10,000 lbs.

Allied Paper Mills. 15.57c

50 Per Cent Antique Book

No. 26—100,000 lbs., 25x38—80; flat, cut 38x48 ins.

No bids

Supercalendered Book

No. 33—40,000 lbs., 25x38—90; flat, cut 28½x48, 31¼x45½, 38x48, and 39x50 ins.

Stanford Paper Co. 7.71c

No. 34—50,000 lbs., 25x38—100; flat, cut 38x48 ins.

Stanford Paper Co. 7.17c

No. 35—1,000,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

R. P. Andrews Paper Co. 7.09c
Mudge Paper Co.
(500,000 lbs. only) 7.35c
Central Ohio Paper Co. 7.04c

No. 36—1,000,000 lbs., 25x38—100; rolls, 28½ and 38 ins. wide (3-inch fiber cores).

R. P. Andrews Paper Co.
(500,000 lbs. only) 6.84c
Mudge Paper Co.
(500,000 lbs. only) 6.84c

Machine-Coated Book

No. 37—500,000 lbs., 25x38—90; flat, cut 35x45, 38x48, and 39x50 ins.

Barton, Duer & Koch Paper Co. 6.30c

No. 38—1,000,000 lbs., 25x38—100 and

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Three Paper Mills Receive U.S. Army Awards

Production Award Goes to Ahdawagam Co. and Safety Achievements To Kimberly-Clark Corp. and Marinette Paper Co.—Mills Plan For Big Safety Rallies—Waste Paper Collection on Increase.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 13, 1943.—United States Army awards were presented to three Wisconsin firms last week, one for outstanding production going to the Ahdawagam Paper Products Company, Wisconsin Rapids, Wis., and one each for safety achievement to Kimberly-Clark Corporation, Neenah, Wis., and the Marinette Paper Company Marinette, Wis.

No special ceremonies accompanied the Ahdawagam presentation of the Army Ordnance Banner, the highest production award available to sub-contractors engaged in the manufacture of war materials. It was made by George B. Vidal of the Chicago post of the Army Ordnance Association on the basis of meeting schedules promptly, despite paper shortages, and for "meritorious production." It was accepted on behalf of the firm by Frank R. Walsh, general manager, and for the employees by Earl Hollstrom, president of Local No. 195, International Brotherhood of Pulp, Sulphite and Paper Mill Workers.

More than 80% of the Ahdawagam output for the last fifteen months has been for army ordnance, including packaging materials and containers weather- and water-proofed for overseas shipments, and tubes and cores.

Because it had the lowest accident rate for the first six months of this year of any Wisconsin industry employing more than 4,000 persons, the Kimberly-Clark Corporation received the army's safety banner. It was presented at a luncheon at the Badger-Globe mill cafeteria at Neenah Wednesday noon, December 8, by Major Edward Millot of Milwaukee, Wis., second district provost marshal of the Sixth Service Command. It is a white silk flag bearing the American eagle and an inscription of the reason for its presentation. Representatives of cooperating agencies present were Voyta Wrabetz, Wisconsin Industrial Commission; W. D. James, Wisconsin Manufacturers Association; Cliff Boulet, Wisconsin Council of safety, and Captain F. M. Wright, chief of the safety and health branch of the Army for Wisconsin and upper Michigan.

Major Millot expressed the army's appreciation for the excellent job of accident prevention achieved by the corporation at its several Wisconsin mills. The banner was accepted on behalf of the company and its employees by William Kellett of the Kimberly-Clark management. Edward Page served as toastmaster, and Charles Sage, vice-president of the corporation, declared in a brief address that the company's safety program was the result of the courage, faith and idealism of one of its officers, S. F. Shattuck, vice-president. Presidents of the independent unions of the mills also spoke, including: Ray Haase, Kimberly, Wis.; George Ritten, Ordnance division, Neenah; Oliver Tracy, Atlas mill, Appleton, Wis.; William Dickson, Niagara, Wis.; and Orville Leffel, Lakeview and Badger-Globe mills, Neenah. Management representatives of each mill also attended.

On the same evening, Major Millot, Captain Wright and Mr. Wrabetz presented another safety banner at a gathering of employees of the Marinette Paper Company at the Legion Memorial building at Marinette, Wis. It was awarded because the mill had the lowest accident rate in Wisconsin in plants employing 500 to 1,000 persons for the first six months of 1943. The frequency rate was 9.13 accidents for each 1,000,000 hours worked.

Maj. Millot commended the workers who had earned the right to fly the safety banner, calling them "soldiers of the production front." He termed the record truly remarkable. The banner was accepted by A. W. Raue, assistant master mechanic. Joseph J. Liska, president of the Employes Mutual Benefit Association, presided and introduced Darcy B. Wilkinson, vice-president and general manager, who spoke briefly, as did Claude Urevig of Chester, Pa., safety manager of the Scott Paper Company, of which the Marinette mill is an affiliate. Mayor Arnold Schmitt also attended and extended congratulations.

Safety committee members who furnished the leadership in the campaign were presented with certificates by Einar T. Martenson, safety supervisor of the plant, and C. L. Chatterton, resident engineer of the Liberty Mutual Insurance Company. A movie, "Smash the Seventh Column," was shown, and the evening was concluded with dancing.

Plan for Big Safety Rallies

Paper mills and allied industries of Neenah and Menasha are making plans for two big safety rallies this winter, one to be held in each city, according to arrangements discussed by officers of the Twin City Safety Council at a dinner at Hotel Menasha, Menasha, Wis., December 8. H. A. Klemm of the Wisconsin Industrial Commission, Madison, Wis., was present to assist in formulating the program.

Dates and speakers will be arranged by Francis T. Rooney of the George Banta Publishing Company, chairman of the council, and Carl Christensen, director of the Neenah School of Vocational and Adult Education, secretary.

Donald Severson of the Neenah Paper Company, E. A. Page of Kimberly-Clark Corporation, and Walter E. Strong, Marathon Paper Mills Company, were appointed on a committee to investigate and plan for a travelling trophy as an award for the best safety record of industries concerned.

Among others attending the meeting were: Joseph Paveletzke, Bergstrom Paper Company; Herman J. Goffin, Bergstrom Paper Company; Howard Aderhold, Marathon Paper Mills Company; J. D. Schmerein and John Eckrich, Menasha Wooden Ware Corporation.

Mills of the Wisconsin River Valley also are planning a safety school to be conducted at Wausau, Wis. during January and February in cooperation with the vocational school. Speakers engaged include: "Yank" Levy, a commando expert, on January 13; Dr. Hilton Ira Jones, scientific lecturer, January 20; Dr. Syud Houssain, January 27, and Barton Rees Poque, humorist, February 3. Preceding each address

there will be sectional meetings, one of which will be devoted to pulp and paper mills.

Waste Paper Collections Increase

Wisconsin cities where paper mills are located are responding especially well to the waste paper collection campaigns, because of their consciousness of what this cooperation means. The drive is statewide, however, and is bringing a heavy tonnage to salvage dealers.

Through a campaign at Wisconsin Rapids, where the Consolidated Water Power and Paper Company is taking all the paper the churches and other agencies can collect, the total has reached 69,016 pounds and still going strong. Wausau, Wis. has set a goal of 50,000 pounds per week. Stevens Point, Appleton, Neenah, Menasha, Marinette and others are doing equally as well. Milwaukee mills are using extensive newspaper advertising, with especially good returns to Hummel and Downing, makers of container board. Most of the house-to-house work is being done by Boy Scouts, in line with the national campaign.

Dr. Bailar Addresses Chemists

Dr. John C. Bailar of the University of Illinois, spoke at a meeting of the Northeast Wisconsin section of the American Chemical Society at Lawrence College, Appleton, Wis., Monday evening, December 6. His subject was "A General Survey of the Chemistry of Coordination Compounds." The coordination theory of Werner and its modernization by Sidgwick, Lowry, Pauling and others was reviewed. The factors influencing the strength of the coordination bond were considered, as well as the transitions between ionic bonds, true covalent bonds and secondary forces.

Soldiers Learn at Kimberly-Clark Plant

Manufacture of the M-45 multiple machine gun turret for anti-aircraft equipment by the Kimberly-Clark Corporation at its ordnance division at Neenah, Wis., is attracting United States army personnel for two-week intensive training schools, according to C. W. Nelson, plant manager. These soldiers, usually in groups of ten, are learning maintenance and operation.

Mill Negotiates for Timber Land

The Nekoosa-Edwards Paper Company, Port Edwards, Wis., is negotiating for the purchase of 45,418 acres of forest lands in the towns of Minocqua and Hazelhurst, in Oneida County, Wis. An offer of $125,354 has been made to the county, which is the owner, and the proposal will be considered at a meeting of the board of supervisors January 6. This will be the largest sale of county-owned land in Oneida's history.

Pyrometer Accessory Manual

The Bristol Company has recently published a new Pyrometer Accessory Manual, Number P1211, giving engineering data on the selection and installation of thermocouples, protection wells, and lead wire; thermocouple and protection well assemblies; and calibration data and tables.

Other information such as molten metal thermocouples, radiation couples, surface contact couples and specific fittings and adopters is also included.

Copies of this manual, Bulletin P1211 can be obtained from The Bristol Company, Waterbury 91, Connecticut.

A Unique Appeal for Waste Paper

Robert Gair Company, Inc., New York, through its two subsidiaries, Fort Niagara Corrugated Box Division, North Tonawanda, and Tonawanda Boxboards Division, Tonawanda, N. Y., has given renewed impetus to the Tonawanda Salvage Drive by the construction, in a prominent location in Tonawanda of a "Scrap Hut." The four walls of this hut are constructed of bales of waste paper of the usual commercial size, each bale weighing approximately 1200 lbs.—30 bales, or a total of 36,000 lbs.

Scrap Hut Erected by Robert Gair Co.

of waste paper being required to build the walls. At the entrance were two Jumbo rolls of corrugated paper, which are made largely from this scrap material, 14 inches in diameter and 72 inches high, each weighing 1500 lbs. Inside the hut was a display of packages made from the board in which waste paper is an essential raw material. These packages included shell cases of various sizes, ammunition boxes, medical supply boxes, and food cartons of all types. All the packages were for use in the armed forces or for essential civilian needs. This display has stimulated the collection of waste paper and has also brought more full time and part time workers, both men and women, to the Gair mills.

Rex Speed Prime Pumps

In the catalog of Rex Speed Prime Pumps which has just been issued is included complete information concerning the mechanical parts and construction of the pump, how the pump operates, and what it will do. Also included are specifications and capacity charts to aid in pump selection.

Rex Speed Prime Pumps are made in capacities ranging from 3000 gallons per hour to 125,000 gallons per hour. They have found application in many industries, and for pumping many fluids. Their chief use is for dewatering purposes, and for this service they offer many advantages—the outstanding of which is their positive selfpriming feature.

Copies of this book, and other books descriptive of the complete line of construction equipment may be obtained by writing to Chain Belt Company, 1600 West Bruce street, Milwaukee, Wis. The complete line of Rex construction machinery includes Rex concrete mixers, Rex MoToMixers (truck mixers), Rex concrete pavers and Rex Pumpcrete (the pump that pumps concrete).

Canadian Cut in Paper Limits Advertising

Order of Wartime Prices and Trade Board Will Effect Drastic Reduction in Direct-Mail and Promotional Pieces—Mill To Shut Down One of Its Newsprint Machines For Lack of Pulpwood.

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 13, 1943.—Commercial paper users are just beginning to fully understand some of the ramifications of a recent new order of the Wartime Prices and Trade Board.

Designed to curtail uses of paper not previously regulated, W.P.T.B. Order No. 332, "Respecting Printed Matter", will have its most important effect in drastic curtailment of direct-mail advertising, the size and character of calendars and the practical elimination of advertising blotters.

The Order puts a ban on promotional advertising beyond 25 pounds of paper a month, which means the elimination of all large-size mailings. The Order applies to practically the whole of business, the only exceptions being government printing, legal work, newspapers and periodicals, literature of non-profit organizations and for personal use. Exemptions have been made on the basis of essentiality. Only the exempted catagories mentioned will be permitted to use business reply cards or envelopes, but envelopes for "original use and return" are permitted. Some trade sources suggest that this may mean an envelope which may be turned inside out for return.

A sharp reduction in the use of promotional literature is bound to result, particularly mailings for stock-selling purposes, which frequently have run into the hundreds of thousands of copies. Such large mailings will no longer be possible on the basis of 25 pounds of paper a month.

Smaller and lighter envelopes may be another result of the new order. Ordinary business letters may in the near future be of the light air-mail variety. By the use of such expedients it is thought that the paper ration might be stretched to cover twice as much territory as formerly.

One feature of the order that is being criticized is the lack of any discrimination between businesses of different sizes. They are all treated alike and no matter how much paper a business has been accustomed to using every month, it is restricted to 25 pounds per month by the order. It is pointed out that while 25 pounds may be sufficient or even more than ample for some businesses, it will be little better than none at all for others. A quota based on former requirements, many opine, would be much more equitable and practicable.

Printed Posters Also Banned

Poster advertising for events for which an admission is charged is on the banned list but no restriction is placed on the use of paper for books of account, professional forms, menus, reports to subscribers, etc., but such forms may not be used for promotional selling. Mimeographing and printing of sales literature is definitely under the 25-pound limit, but apparently there is no regulation which would prevent the typing of a large number of letters for sales purposes. The quota of 25 pounds of paper per month, it is estimated, is equivalent to approximately 2,500 sheets of paper.

The W.P.T.B. division at Toronto was so besieged with inquiries from worried businessmen early last week, following the announcement, that rulings were generally only being made in reply to written inquiries. The *Financial Post* recounts the story of a printer handling one of the country's largest mail order catalogues, who was distinctly concerned over the provision that "this order does not prohibit completion, up to, but not after, December 31, 1943, of printed matter in process of manufacture at the effective date of the order." The catalogue concerned cannot possibly be completed before next February, and the printer wonders whether or not to proceed. A section of the regulations says that such catalogues may be printed, but only if less than 500 pounds of paper is used. It is pointed out that very few catalogues of importance have been printed in the past which have not used much more than 500 pounds of paper.

To Shut Down One Newsprint Machine

As intimated in these columns some time ago, the Ontario and Minnesota Pulp and Paper Company, Ltd., will shut down, at the end of the year, one of its Fort Frances, Ont., newsprint machines, capable of producing 21,000 tons of paper annually. Mill officials say a shortage of pulpwood supply is responsible. Their larger machine, with a capacity of 36,000 tons annually, will continue operations.

Plan to Reopen Tacoma Pulp Mill

Roy K. Ferguson, president of the St. Regis Paper Company, has announced that his company had perpetual cutting rights to 109,000 acres of timber land in Lewis County, Washington, and all the logging operations of the West Fork Timber Company, whose president, L. T. Murray, becomes associated with the St. Regis Company.

As a result the company expects soon to reopen its Tacoma mill for the production of pulp for specification Kraft paper, which will be converted chiefly into multiwall paper bags for foodstuffs, chemicals and construction materials.

Although 1943 will see the production of multiwall bags at an alltime peak in the United States, the War Production Board has asked the industry to expand production for 1944 by a further 40 per cent in order to meet military and civilian needs, according to Mr. Ferguson.

Although the timberlands involved were virtually closed last year by Government order in order to create a reserve for nitrating—the manufacture of the pulp ingredients for explosives—Mr. Ferguson indicated that this situation has changed due to a re-examination of the military needs for nitrating pulp.

As a result of the operations contemplated, an additional 100,000 tons of pulp will be made available annually through the reopening of the Tacoma mill, the announcement said. It will be under the direction of Walter DeLong, St. Regis vice president.

Expects More Definite End-Use of Paper

Midwest Market Reflects More Optimism But Fears Adjustment of Paper Supply Situation May Lag Behind Output in Other Consumer Goods—Demand For All Lines of Paper Heavy. Other News

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 13, 1943.—Despite the tightness of the local paper situation observers here are becoming a bit more optimistic over the ability of the mills to adapt themselves to the use of substitutes and materials otherwise construed as either waste or unadaptable to the industry. The deinking of newspaper is considered as a noteworthy step in this direction. Meanwhile, however, the time is reported to be drawing more near when general paper users in the country will have to establish a definite "end use" in line with the War effort. Pulp inventories are so very low, compared with normal times, that the immediate outlook is said to point to this very careful selectivity to avoid critical shortage in the most needed of usages.

Government "Over Using" Paper

More often than formerly, there crops up in conversations with paper executives the fact that the Government itself is "over using" paper in a multiplicity of forms and regulatory material that is not altogether necessary. There is also the feeling, in some quarters, that the industry is "too careful" to maintain friendly government relationships, an attitude which speaks for itself in relation to the pressure from other industries for attention to procedure and waste which "has no correlation with the War effort."

Specifically, groundwoods and newsprints experienced perhaps the sharpest upturn here though printing papers found the advertising and publishing industry inordinately eager to "get going" on 1944 selling programs despite the shortage of civilian goods. In all lines there is the fear that civilian goods will come back on shelves before the paper situation is partially corrected, and thus lead to an even more tight situation.

Waste paper collections here have been qualifiedly successful but are growing in recognition from the public itself.

Salesmen Hear Two Guest Speakers

Two guest speakers were present at the regular Monday noon meeting of the western division of the Salesmens Association of the Paper Industry held on December 6. The first, Leo Kraemer, research engineer of the Edward Hines Lumber Company, went into interesting detail to describe lumber and logging operations of the company which has a large number of lumber yards in the Chicago and surrounding area. Mr. Kraemer outlined the difficulties surrounding present day logging and conversion work and stressed the fact that while logging may have grown up in the public eye as a romantic operation surrounded by drama and mystery, it really was a two fisted operation with no "romantic backdrop". Mr. Kraemer stated that the lumber industry faced the future with no lack of confidence and that whatever fears were prevalent stemmed from a realization of the untapped possibilities of the paper industry itself.

The second speaker on the noon program was Robert Ross, formerly with the purchasing department of R. R. Donnelley printers, and now with the Printing and Pulp division of the War Production Board. Mr. Ross outlined some of his experiences with WPB and briefly analyzed WPB order L-241 and stressed the importance of its full observance on the part of the industry.

To Honor Members in Armed Forces

The details of the annual SAPEYE Christmas party were also mentioned and members were urged to attend the program at the Sherman Hotel at 5 P.M. the afternoon of December 29 for a meeting designed to honor members now in the armed forces. Burt Fisher and Ben Babbitt, the latter long the "major domo" of the Christmas parties, are the main factors in preparing this unusual and timely Christmas program.

Like "Self-Help" Idea

Local allied trades are responding very favorably to the latest mailing piece sent into this territory by the Bryant Paper Company of Kalamazoo. The copy of this attention getting statement features an appeal to the paper merchants to give their wholehearted support to waste paper campaigns in the cities wherein they operate. The statement points out that the paper merchant is going to help insure himself a supply of printing paper "tomorrow" by "cooperating today in getting waste paper into the salvage drive" and urges dealers to give some thought to the Kalamazoo Waste Paper Collection Plan which is being used as a model in many communities. "If you don't help yourself you can't expect everyone to do the job for you" is about the theme of the program.

Protest Mail Rate Increase

Homer Buckley, head of Buckley-Dement Company, Chicago direct mail concern, appeared this week before the Conference of Small Business Men held at the Edgewater Beach Hotel, and urged adoption of resolutions asking Congress to defer enactment of that part of the tax bill referring to increases in postal rates. Mr. Buckley, who had previously appeared before the Senate Finance Committee in Washington, representing allied trades in this area, stated that all the direct mail users wanted was to "take out that section of the tax bill pertaining to postal rates and submit it to the Post Office authorities and business mail users to determine, on a scientific basis, just what could stand increases and what could not". The charge was made that the House had made no real effort to study the effect of the increases on profits and losses of indispensable business concerns and that "there was no reason why Congress could not carefully study the entire program before making the leap". This area has been unusually active in protesting the mail increases and paper executives looking into the future are also expressing concern over the trend these increases might develop.

May Ask For Higher Newsprint Prices

Prospect That Pulpwood Shortage May Yield Lower Unit Profits Revives Talk of an Upward Revision—This Year's Advances of $8 a Ton Provide Profits For Most Producers—Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 15, 1943.—There is talk here of possible steps looking for a future upward revision of newsprint prices for next year, to take care of steadily increasing costs of production. For the current year the price advances granted, totalling $8 a ton, have gone a considerable way towards offsetting higher pulpwood and wage costs, and as a result it is thought that more newsprint companies are likely to show profits not far from the 1942 level. Indeed, there is a possibility that some of the companies, due to non-newsprint activities, may show a small increase in profit. However, the outlook is not so good for 1944. There is the possibility that, due to the pulpwood shortage, output will decline, which will mean lower unit profits. Then, as a result of recent adjustments, wage payments, which are an important item, have gone up, and there is a considerable increase in the cost of obtaining pulpwood.

Discussing this subject, the Financial Times of Montreal, says: "To obtain further upward adjustment in newsprint prices, approval of U. S. as well as Canadian price authorities will be necessary. In the rulings in favor of price advances this year, the price control boards gave recognition to increased costs, and attempted to adjust prices to correspond with price increases.

"Advertising volume in the United States has been increasing, with demand for space in leading papers greater than amount available under present newsprint use restrictions. With revenue situation of publishers reasonably favorable, chances for newsprint price adjustments are helped."

Some Improvement in Pulpwood Situation

During the past month there has been an encouraging increase in the movement of men into the bush to cut pulpwood. In part this movement has been aided by the government ruling placing wood cutting a "B" category in National Selective Service ratings, and in part it has reflected the intense efforts by the companies to get men into the wood camps. To date however, the wood-cut has been below that of last year, and wood piles, it is stated, are not sufficient to last much beyond next spring. The movement continues to utilize prisoners of war and men from Japanese internment camps in the woods, the latest announcement in this direction telling of two carloads of German prisoners who have gone to the lumber camps in Alberta for this work. If the movement of farmers and other temporary workers into the woods continues, there is a chance that the cut for the coming winter may be sufficient to maintain newsprint production levels somewhere near those of the present year, but even so much will still depend upon snow conditions and other factors.

OPA Order Reduces Sheets in Pads

WASHINGTON, D. C., December 15, 1943.—Because of two $4-a-ton increases in newsprint paper during 1943, the Office of Price Administration today authorized a reduction in the number of sheets in tablets, pads and related products made from newsprint paper so that production and sale of these items may be continued at prevailing ceiling levels.

Reductions of between five and ten sheets were authorized in the pads and tablets that generally retail at five cents each, and of ten and twenty sheets in pads made to retail at ten cents. On the average, seven sheets may be removed from a five-cent pad, and and fourteen sheets from a ten-cent pad. Five-cent pads generally have 40 to 100 sheets, with the ten-cent pads double that number, and the reduction in sheets authorized today varies, depending on the total sheet number.

This action will relieve manufacturers approximately to the extent of higher prices they have had to pay for newsprint paper and will assure continued production of the pads and tablets made from this paper, OPA said.

While consumers, approximately 70% of whom are school children, will receive fewer sheets when buying these pads and tablets, the lesser return for the same money is more than offset by the production afforded from substantially higher prices that would have to be paid if the newsprint items were no longer produced and buyers had to shift to other lines, OPA said. Other pads and tablets sell at higher prices as newsprint tablets constitute the lowest priced line of the standard items made by the industry.

The proportion of newsprint tablets to all types of tablets produced may be judged by the ratio of newsprint paper to the total paper materials consumed by the tablet industry. For a recent representative period this proportion was approximately 13.5 percent.

Simultaneously, OPA today granted a ceiling increase on plain or ruled newsprint paper cut to size, packaged in 500 or 1000 sheets. Price relief is given on this one line, rather than a reduction in sheet count, since an outright increase in price is not subject to the same objection as the conventional five and ten cent retail prices existing in the case of pads or tablets. Resellers, manufacturers and converters are permitted to add to their existing ceilings on this paper a sum equal to the difference between their paper costs in March 1942 and current paper costs. Retailers will be able to pass on this increase to the consumers. It will amount to approximately six per cent on current prices at the manufacturing level.

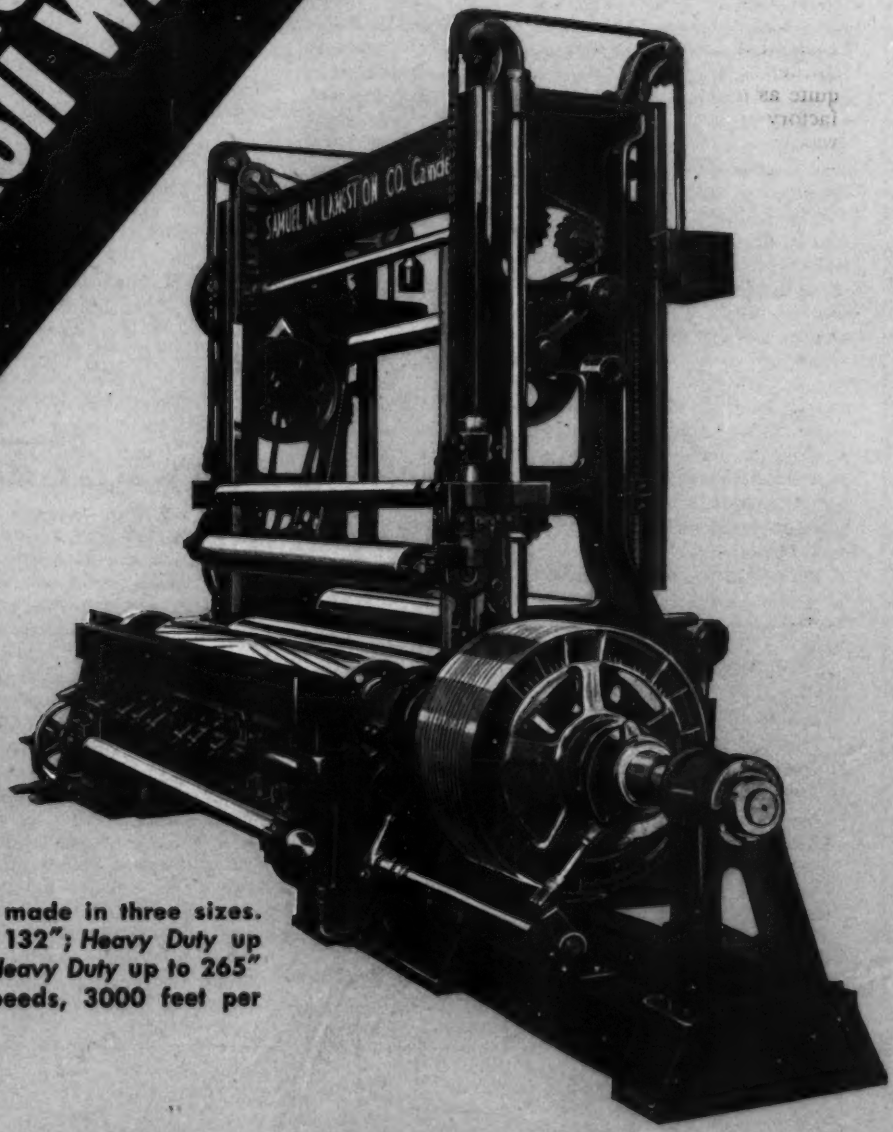
In a third action today, plain social stationery or papeteries and certain related items such as correspondence goods sold in quires or reams are taken from the General Maximum Price Regulation both at the manufacturing and distributor levels and placed under the printed paper regulation. More effective price control over plain stationery will be made possible by putting this line under the same regulation as printed stationery. Except for a small volume of stationery made from lightweight bond paper, ceilings of manufacturers will not be changed by this move, which is taken largely for administrative purposes.

LANGSTON
Slitters and Roll Winders

Massive beds and solid side frames eliminate vibration. Nitrided steel gears, roller and ball bearings, accurate machining and careful balancing make Langston Slitters and Roll Winders unbeatable for high speed operation.

From tissue to heavy board, narrow to wide cuts, small to large diameters—there is a type and size for every job in mill, finishing room and converting plant.

SAMUEL M. LANGSTON COMPANY, ***Camden, New Jersey***



TYPE "DA", made in three sizes. *Standard* up to 132"; *Heavy Duty* up to 172"; *Extra Heavy Duty* up to 265" and above. Speeds, 3000 feet per minute.

N. E. TAPPI Discusses Waste Papers

About one hundred members and guests of the New England Section of the Technical Association of the Pulp and Paper Industry met at the University Club, Boston, Mass., on Friday evening, December 10th. W. L. Foote of B. F. Perkins & Sons, Inc. presided as chairman.

Reutilization of Waste Papers was the main subject discussed. R. H. Doughty of the Fitchburg Paper Company and Norman I. Bearse of the Champion-International Company were in charge of the meeting arrangements and Frederick C. Clark led the discussion. A panel of participants included Ben Gold, North Shore Waste Paper Company, Norman Alper of N. S. Alper & Sons, W. F. Hoffman, Fitchburg Paper Company, H. L. O'Neil, Falulah Paper Company, C. S. Huestis, Robert Gair Company, Inc., and H. T. Barker, Bird & Son. R. G. Macdonald, National Secretary of TAPPI also spoke on the subject.

Frederic C. Clark outlined the economic and technical phases of the subject, including the manufacturing techniques of the deinking process. Mr. Clark's remarks will be published in the near future. In brief he reported on recent experiments made for Time and Life wherein deinked newsprint was used as a substitute for groundwood. Although the product was not quite as good as groundwood the results were satisfactory from the printing standpoint. Soap and tallol was used with soda ash and caustic soda. The latter when used alone was not effective.

The present situation of pulp shortage is largely due to diminished manpower resulting in decrease in pulp wood supply of 3½ million cords. Every 1500 pounds of waste paper collected in the current drives will correspond to a cord of wood. Deinked papers at a cost of $38.25 per ton is not economical in normal times but is a reasonable cost in the present emergency.

Ben Gold of the North Shore Waste Paper Company, Salem, Mass., gave a very interesting talk, presenting the viewpoint of the waste paper supplier and described the difficult economic and operating problems facing his industry in good and bad times. The present problem is one of inadequate price ceiling and manpower shortage.

W. F. Hoffman commented on the large proportion of groundwood that now is included in waste papers. In the pressure of the shortage such papers must be used.

C. S. Huestis mentioned the inadequate supply of corrugating long fiber stock available, although there is plenty of old news.

Herman Barker amplified this statement and pointed out that much of the long fiber is going overseas in boxes. This is not returned.

Norman Alper indicated that there would be a continued shortage of waste paper insofar as the waste dealers are concerned because of the low price ceiling. He advocated a revised attitude toward the waste dealer wherein he would be encouraged to render better service through collection, sorting, dusting, baling and classifying papers for the mills. There is at present but little incentive to do anything along this line. He predicted a building boom after the war in which waste paper products will play an important role. Closer cooperation between the mill and the dealer will result in improved loyalty and service. More waste plants should be mechanized with power balers, etc. Unless better relations are established, it is likely that there will be more incinerators installed by cities and stores to get rid of the paper which the waste dealer does not find profitable to collect. The users of waste paper should awaken and protect itself against some of these inevitable trends before it is too late.

The following were present: Louis Adams, R. W. Alanson, Harold A. Allen, Norman Alper, Lewis O. Boker, A. E. Bachmann, G. H. Batchelder, H. T. Barker, Arthur C. Bate, Mr. and Mrs. N. I. Bearse, Ward Beckwith, Mr. and Mrs. F. K. Becker, H. F. Bigelow, A. F. Bolles, Philip Bolton, Alfred D. Bonanno, Alfred Brendt, Arthur M. Brooks, Paul Brown, John Carey, C. H. Child, G. C. Clark, Mrs. Carson, Tom Collins, Joseph L. Coburn, L. W. Crouse, J. F. Dockum, R. H. Doughty, Ed Dudley, H. E. Duston, C. P. Dyer, Frank R. Fitz, W. L. Foote, A. E. Fuller, Fred Gibbs, Ben Gold, Roger C. Griffin, John J. Hankard, Robert Hantz, J. Healy, Henry M. Hill, W. F. Hoffman, Amos Hollingsworth, Jr., Fred Holt, H. J. Hosking, C. S. Huestis, M. Jacobs, Henry D. Johnston, D. Werner Kaufmann, C. H. Kent, R. E. Kilty, Warren S. Kumblad, Maurice N. Labelle, A. Lake, S. J. Leishman, Herbert S. Leonard, J. J. Lewis, H. A. Lindenberg, Richard E. Loebenberg, R. G. Macdonald, Gustas Macklup, Wm. W. Marshall, K. W. Max, H. L. Mellen, R. D. McCarron, J. J. O'Brien, H. J. O'Neil, F. W. O'Rourke, Herman Otto, R. Pohl, Gilbert Parks, Mr. and Mrs. Harold R. Rafton, H. J. Richardson, L. B. Rogers, Murray Rubin, Col. Sanford E. Thompson, W. L. Sheedy, H. J. Skinner, Chas. P. Slocum, Wm. P. Stillman, Jack Stokes, Earl Stafford, F. A. Strovenk, Walter J. Sullivan, B. R. Taylor, Roy Tewkbury, Stowe Woodward, Robert W. Worden and Jack Fife Wright.

N.A.W.M.D. to Meet March 14 and 15

The board of directors of the National Association of Waste Material Dealers, Inc. at a meeting held in New York on Tuesday, December 7, among other things, made provision for the association's thirty-first annual convention and war conference which is to be held at the Hotel Astor, New York on March 14 and 15, 1944.

While the convention will formally open on Tuesday, March 14, registration facilities will be available on the afternoon of the 13 and some committee meetings will probably be held on that day.

The program will be formulated with the idea of making it contribute one hundred per cent to the war effort. E. J. Keller of the E. J. Keller Company, New York was appointed chairman of the convention committee and Sidney Danziger, eastern representative of H. Kramer & Co. of Chicago, was appointed chairman of the dinner committee. At the same meeting Robert Miller of R & V Miller, Inc., New York, was elected chairman of the woolen bag graders division and Wm. J. Green of W. J. Green Company, Inc., New York, was eelcted chairman of the foreign trade division.

COTTRELL PROCESS

of

ELECTRICAL PRECIPITATION

universally recognized as a standard method of removing

DUST, FLY ASH, FUME, MIST & FOG

***from* GASES**

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30 years of research, development and operating experience throughout the world are incorporated in the

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offered to meet the requirements of any problem by

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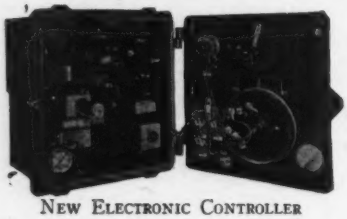
New Pneumatic Controller

The C. J. Tagliabue Manufacturing Company of Brooklyn, N. Y., announces the development of the new Celectray pneumatic indicating controller—the first instrument of this type that does not employ a motor or other continuously moving parts.

Some of the unique features include, no motor, continuous action, no measurable "dead zone", highest sensitivity and adjustment to very low sensitivity, no mechanical connection between galvanometer and pneumatic circuit, no "flapper" and simple load error adjustment (manual reset).

The original Celectray controller, with its mirror galvanometer and photelectric amplifier, is here combined with a pneumatic follow-up without losing any of its excellent characteristics. The output air is precisely and stably controlled to provide the utmost in performance, according to the inherent possibilities lying in ordinary throttling control with manual reset or with automatic reset and/or TAG's "quick response." On-and-off or open-and-shut control is available in two models, high sensitivity, non-adjustable throttling or on-and-off without throttling.



NEW ELECTRONIC CONTROLLER

The measuring circuit in this instrument, including the galvanometer and the photoelectric system are identical with the standard Celectray controller, but in place of the relay found in that controller there has been substituted a magnetic air-valve which acts as an amplifier and converter from electric to pneumatic operation.

The light beam "follow-up" flag is moved back and forth by changes of the air pressure in the bellows of the "follow-up" assembly unless the sensitivity-adjusting arm is turned to the highest sensitivity on its scale. With this adjustment, the throttling range is zero, the flag stands still as the control pressure varies and the controller acts as an on-and-off or open-and-shut controller, opening or closing the valve to its limits for small changes in temperature, for example. Now as the temperature varies, the light image moves across the controlling edge of the flag and more or less of the light reaches the phototube. More light on the phototube causes more current to flow through the magnetic air valve. This in turn draws in the armature, moving the orifice tongue closer to the orifice in the block and raising the controller air pressure. Less light on the phototube thus lowers the controlled air pressure by decreasing the current to the magnetic air valve.

If the sensitivity is lowered by moving the arm to a lower value on the scale, then the flag will follow the light beam as it moves back and forth with changes of temperature. The flag will follow to the limits of the throttling zone as determined by the position of the arm.

The manufacturer claims that this instrument is . . . least affected by process lag . . . nearest approach to ideal performance . . . fastest response . . . stable at smaller throttling zones . . . not affected by long leads . . . simple in operation and adjustment . . . vibration proof.

Latest information will be sent on request by addressing the C. J. Tagliabue Manufacturing Company, 550 Park Avenue, Brooklyn 5, N. Y.

Newsprint Production for November

Production of newsprint in Canada during November 1943 amounted to 256,336 tons and shipments to 260,590 tons according to the Newsprint Service Bureau. Production in the United States was 66,456 tons and shipments 67,490 tons, making a total United States and Canadian newsprint production of 322,801 tons and shipments of 328,080 tons. During November, 26,855 tons of newsprint were made in Newfoundland, so that the North American production for the month amounted to 349,656 tons. Total production in November 1942 was 346,708 tons. There was one more working day in November 1943 than in November 1942.

The Canadian mills produced 199,807 tons less in the first eleven months of 1943 than in the first eleven months of 1942, which was a decrease of six and eight tenths percent. The output in the United States was 135,315 tons or fifteen and four tenths percent less than in the first eleven months of 1942, in Newfoundland production was 44,474 tons or seventeen and two tenths percent less, making a total decrease of 379,596 tons, or nine and three tenths percent less than in the first eleven months of 1942.

Stocks of newsprint paper at the end of November were 56,879 tons at Canadian mills and 13,783 tons at United States mills, making a combined total of 70,662 tons compared with 75,941 tons on October 31, 1943, and 101,493 tons at the end of November 1942.

Capital Paper Co. Holds Sales Meeting

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., December 13, 1943.—The Capital Paper Company here held its annual sales convention December 8 to 10 in the Hotel Lincoln. C. V. Jewell, vice president and sales manager, presided and new lines were introduced. Next year's plans were discussed and stock limitations explained. Mill representatives held the floor during the second day.

Among the speakers were E. J. Durkin, vice president of Tanglefoot Company, Grand Rapids, Mich., and president of the Paper and Twine Club; John Richey, secretary of the Middle States Wrapping Paper Association, Cincinnati, and Ed Hall, mill representative, Cincinnati. The meeting closed with an informal dinner at the Hotel.

Archie Chandler Retires

Archie Chandler, vice president of the American Pulley Company, Philadelphia, has announced his retirement from active sales management of the company. Mr. Chandler, who is widely known throughout the industry, will continue as vice president, but will return to his former home in San Francisco, where he will direct the company's sales and service on the West Coast. He has been with the American Pulley Company since 1915 and was located on the West Coast until 1928, when he came to Philadelphia to become general sales manager. Frank E. Brown, for 15 years assistant sales manager, has been named to succeed Mr. Chandler as general sales manager.

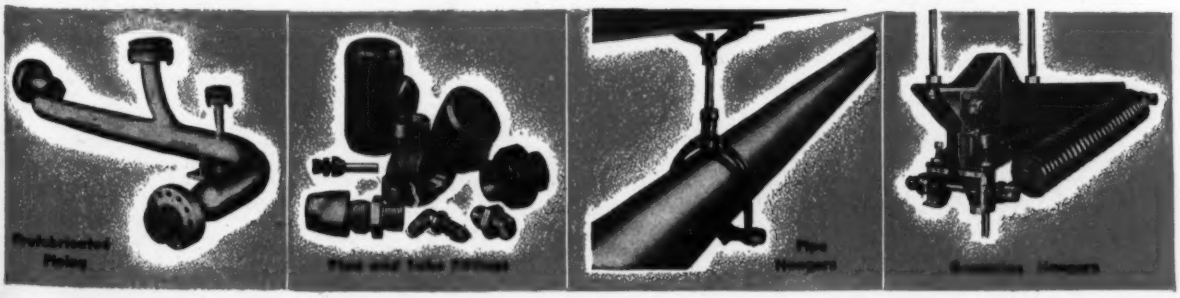
"HOW LONG WILL IT LAST?" is Question No. 1 among specifiers of piping materials for today's process industries. The chemicals to be transported are frequently highly corrosive, so the pipe, valves and fittings selected must be able to withstand their destructive action.

Typical of Grinnell products for this type of service is the Saunders Diaphragm Valve. Its design, permitting a variety of diaphragm materials and body linings to handle each chemical, makes it a long-life valve for process piping. As leading piping engineers and fabricators, Grinnell is furnishing this and other component parts which provide FLUID TRANSPORT in plants producing heavy chemicals, synthetic rubber, food, drugs and the entire range of petroleum products.

For engineering assistance or piping materials for any type of FLUID TRANSPORT, call Grinnell Company, Inc., Executive Offices, Providence, R. I. Plants and offices throughout United States and Canada.

GRINNELL

WHENEVER *Piping* IS INVOLVED



JOINT PRINTING COMMITTEE OPENS PAPER BIDS

(Continued from page 9)

120; flat, cut 35x45, 38x48, and 39x50 ins.

Barton, Duer & Koch Paper Co. 5.87c
Mead Sales Co.
(60 lb. basis—300,000 lbs. only) 7.13c
(50 lb. basis—300,000 lbs. only) 7.66c

Coated Book

No. 41—600,000 lbs., 25x38—140; flat, cut 38x48, and 39x50 ins.; the grain to run lengthwise of the sheet.

Perkins-Goodwin Co.
(300,000 lbs. only) 8.78c

50 Per Cent Machine-Finish Lithograph

No. 43—40,000 lbs., 25x38—160; flat, cut 10½x16 ins., the grain to run lengthwise of the sheet.

Walker Goulard Plehn Co.
(Not less than 5,000 to 10,000 lbs.) 15.50c
(Not less than 10,000 to 20,000 lbs.) 15.25c
(Not less than 20,000 to 40,000 lbs.) 15.00c

Ground Wood Mimeograph

No. 44—2,000,000 lbs., No. 36; flat, cut 32½x42½, and 38x48½ ins., grain as ordered.

Bulkley, Dunton & Co.
(300,000 lbs. only) 5.75c
Great Northern Paper Co.
(1,000,000 lbs. only) 5.90c
Marquette Paper Corp.
(200,000 lbs. only) 5.75c
Barton, Duer & Koch Paper Co.
(600,000 lbs. only) 5.84c
D. L. Ward Paper Co.
(200,000 lbs. only) 5.75c
(600,000 lbs. only) 6.00c
Whitaker Paper Co.
(100,000 lbs. only) 5.75c
Mead Sales Co.
(1,000,000 lbs. only) 5.55c
Old Dominion Paper Co.
(1,000,000 lbs. only) 5.5624c

Chemical Wood Mimeograph, White and Colored

No. 45—400,000 lbs., white, No. 36; flat, cut 32½x42½ and 38x48½ ins.; the grain to run as ordered.

Whitaker Paper Co. 6.91c

No. 46—150,000 lbs., blue, buff, green, pink and yellow, No. 36; flat, cut 32½x42½ and 38x48½ ins.; the grain to run as ordered. Min. order, one color, 10,000 lbs.

Cauthorne Paper Co. 8.25c

25 Per Cent Mimeograph

No. 47—400,000 lbs., No. 36; flat, cut 32½x42½, 34½x44, and 38x48½ ins.; the grain to run as ordered.

Aetna Paper Co. 9.72c
Old Dominion Paper Co.
(200,000 lbs. only) 9.46c
(200,000 lbs. only) 10.18c

Blue U S M O Safety Writing

No. 48—250,000 lbs., No. 32; rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

R. P. Andrews Paper Co. 12.83c
D. L. Ward Paper Co.
(125,000 lbs. only) 12.74c

Ground Wood Writing, White and Colored

No. 50—1,000,000 lbs. white, No. 32; flat, cut any size, min. width 32 ins., max. width 48 ins.

Marquette Paper Corp.
(500,000 lbs. only) 6.40c
Walker Goulard Plehn Co.
(400,000 lbs. only) 6.40c

No. 51—2,000,000 lbs. white, No. 36; flat, cut any size, min. width 32 ins., max. width 48 ins.

Whitaker Paper Co.
(200,000 lbs. only) 6.40c
Frank Parsons Paper Co.
(400,000 lbs. only) 6.40c
Wilcox, Walter, Furlong Paper Co.
(600,000 lbs. only) 6.40c
Old Dominion Paper Co.
(100,000 lbs. only) 6.25c
(100,000 lbs. only) 6.40c

No. 52—100,000 lbs. yellow, No. 36; flat, cut any size, min. width 32 ins., max. width 48 ins.

D. L. Ward Paper Co. 6.65c
Frank Parsons Paper Co. 6.65c
Bermingham & Prosser Co. 6.50c

Chemical Wood Writing, White and Colored

No. 55—4,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.

Marquette Paper Corp. 7.85c
Barton, Duer & Koch Paper Co.
(Aggregate of 1,000,000 lbs.)
Lots 55, 56, 57 and 58) 7.80c
D. L. Ward Paper Co.
(500,000 lbs. only) 7.85c
Whitaker Paper Co.
(Maximum of 3,100,000 lbs.)
Lots 55, 57 and 58) 7.69c
Stanford Paper Co.
(Maximum 500,000 lbs. Lots 55 and 57) 7.87c

No. 56—5,000,000 lbs., white No. 36; flat, cut any size, min. width 21 ins., max. width 48 ins.

R. P. Andrews Paper Co.
(1,500,000 lbs. only) 7.19c
Barton, Duer & Koch Paper Co.
(Aggregate of 1,000,000 lbs.)
(Lots 55, 56, 57 and 58) 7.25c

No. 57—1,500,000 lbs., white, No. 32; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

Bulkley, Dunton & Co.
(500,000 lbs. only) 7.515c
Marquette Paper Corp. 7.61c
Butler Co. (150,000 lbs. only) 6.40c
Barton, Duer & Koch Paper Co.
(Aggregate of 1,000,000 lbs.)
Lots 55, 56, 57 and 58) 7.50c
D. L. Ward Paper Co.
(500,000 lbs. only) 7.61c
Whitaker Paper Co.
(Maximum 3,100,000 lbs. Lots 55, 57 and 58) 6.95c
Stanford Paper Co.
(Maximum 500,000 lbs. Lots 55 and 57) 7.62c

No. 58—2,500,000 lbs., white, No. 36; rolls, min. width 16 ins., max. width 48 ins. (3-inch fiber cores).

R. P. Andrews Paper Co.
(1,000,000 lbs. only) 6.89c
Central Ohio Paper Co.
(50,000 lbs. only) 6.65c
Barton, Duer & Koch Paper Co.
(Aggregate of 1,000,000 lbs.)
Lots 55, 56, 57 and 58) 7.00c
Whitaker Paper Co.
(Maximum 3,100,000 lbs. Lots 55, 57 and 58) 6.90c

No. 59—2,000,000 lbs., blue, buff, green, pink, salmon and yellow Nos. 32 and 36; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.

Marquette Paper Corp. (sub 32) 8.54c
(sub 36) 8.09c

No. 60—200,000 lbs., blue, buff, green, pink, salmon and yellow, Nos. 32 and 36; rolls, 32 and 38 ins. (3-inch fiber cores).

No bids

Lithograph-Finish Map

No. 63—20,000 lbs., Nos. 32 and 40 flat, cut any size. Min. width 22 ins. Maximum width 48 ins.

No bids

50 Per Cent Lithograph-Finish Map

No. 64—100,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 22 ins., max. width, 48 ins., the grain to run lengthwise of the sheet.

Bermingham & Prosser Co.
(50,000 lbs. only) 16.50c
Aetna Paper Co. 15.36c

No. 65—300,000 lbs., Nos. 48 and 56; flat, cut in any size, min. width 22 ins., max. width 48 ins.; grain to run lengthwise of the sheet.

Stanford Paper Co.
(150,000 lbs. only) 15.50c
Aetna Paper Co.
(200,000 lbs. only) 15.07c
Graham Paper Co.
(50,000 lbs. only) 15.95c
(50,000 lbs. only) 16.10c

75 Per Cent Lithograph-Finish Map

No. 66—150,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; ream markers to be omitted.

Mudge Paper Co. (sub 32) 18.00c
(sub 40) 17.50c
Barton, Duer & Koch Paper Co. 16.67c
Virginia Paper Co.
(50,000 lbs. only) 18.00c
Graham Paper Co.
(60,000 lbs. only) 19.25c

No. 67—60,000 lbs., Nos. 48 and 56; flat, cut any size, min. width 30 ins., max. width 48 ins.; the grain to run lengthwise of the sheet; ream markers to be omitted. Min. order, one substance, 5,000 lbs.

Mudge Paper Co. (sub. 48) 17.25c
(sub 56) 17.00c
Paper Corp. of U. S. 18.48c
Bulkley, Dunton & Co. 18.00c
Butler Co. 18.03c
Barton, Duer & Koch Paper Co. 17.17c
Graham Paper Co. 18.85c

50 Per Cent White Chart Lithograph-Finish

No. 68—2,000,000 lbs. No. 80; flat, cut any size, min. width 22 ins., max. width 46 ins.; packed in cases of 1,000 sheets each; the grain to run lengthwise of the sheet unless otherwise specified.

Barton, Duer & Koch Paper Co.
(sub 48) 18.45c
Franklin Research Co. 18.40c
Stanford Paper Co.
(50,000 lbs. only) 18.00c

Chemical Wood Manifold, White and Colored

No. 71—500,000 lbs., white, No. 18; flat, cut 21x32, and 32x42 ins.; the grain to run 21-inch and 42-inch ways.

Cauthorne Paper Co.
(500,000 lbs. only) 9.95c
Old Dominion Paper Co. 9.2199c
Graham Paper Co. 9.22c

No. 72—200,000 lbs. white, No. 18 rolls, 24 ins. wide. (3-inch fiber cores).

Butler Co. 9.25c
Old Dominion Paper Co. 8.979c

No. 73—400,000 lbs, blue, green, pink, and yellow, No. 18; flat, cut 21x32, 22x34, 28x34 and 32x42 ins.; the grain to run the 21-inch and 42-inch ways. Min. order, on color 5,000 lbs.

Bradner, Smith & Co.
(200,000 lbs. only) 9.75c
Old Dominion Paper Co. 9.9688c
Graham Paper Co.
(200,000 lbs. only) 9.72c

50 Per Cent Manifold, White and Colored

No. 75—50,000 lbs., white, No. 14; flat, cut 38x48 ins. Min. order, 5,000 lbs.

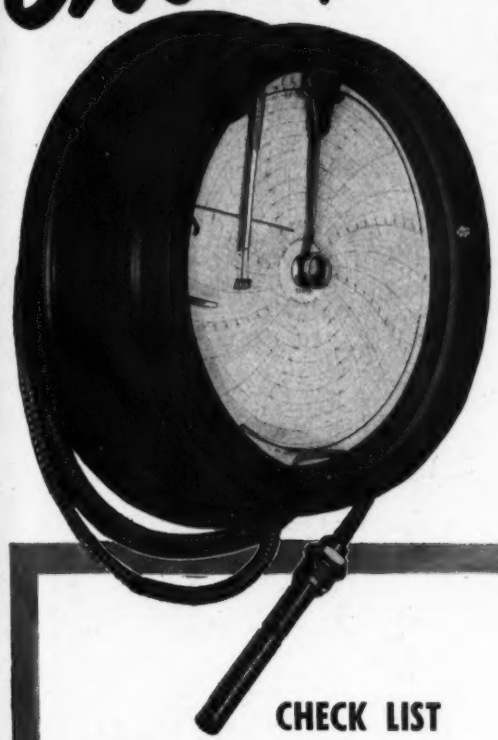
Marquette Paper Corp. 22.50c

No. 76—600,000 lbs., white, No. 18; flat, cut 21x32, 22x34, 28x34, and 32x42 ins.; the grain to run the 21-inch and 42-inch ways.

R. P. Andrews Paper Co.
(40,000 lbs. only) 20.50c
Collins Mfg. Co.
(100,000 lbs. only) 19.35c

(Continued on page 22)

Check These Chances



to improve your production through temperature records!

CHECK LIST

A few major temperature points where records from Foxboro Temperature Recorders often reveal opportunities for important production improvements:

PAPER STOCK LINES	BEATERS
DRYERS AND OVENS	GRINDERS
CHLORINE LINES	DIGESTERS
ACCUMULATORS	BLEACHERS
CONDENSERS	SIZE TANKS

A STAR IS ADDED . .

For continued outstanding production, The Foxboro Company has won renewal of the Army-Navy "E" Award.

Is it worth a few minutes of your time to stop important losses in your output, wastes of fuel, or spoilage of materials? All you need to do is review the critical temperature points in your equipment, and make sure you're getting daily records that "show up" such production losses!

No matter what step in your operation demands uniform temperature, Foxboro Temperature Recorders will automatically give you exact information to save quality-variations, spoilage and re-runs. Their ultra-sensitive thermal system reacts instantly to slightest temperature deviations. Their light, strong mechanism "writes it down" *accurately* for years, without attention except routine chart changes.

The Foxboro Temperature Recorder is one instrument you can always depend on. Precision-engineered for accuracy, endurance and trouble-freedom, it gives the facts at minimum cost per year! Write for full details in Bulletin 198-2. **The Foxboro Company, 114 Neponset Avenue, Foxboro, Massachusetts, U. S. A.**

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TEMPERATURE RECORDERS

JOINT PRINTING COMMITTEE OPENS PAPER BIDS

(Continued from page 20)

Butler Co. .....
(40,000 lbs. only) 19.60c
(80,000 lbs. only) 19.80c
Barton, Duer & Koch Paper Co.
(40,000 lbs. only) 19.00c
Whitaker Paper Co. .....
(200,000 lbs. only) 18.75c
Chicago Paper Co. .....
(50,000 lbs. only) 20.45c
Bradner, Smith & Co. .....
(40,000 lbs. only) 18.60c
Stanford Paper Co. .....
(40,000 lbs. only) 18.30c
(80,000 lbs. only) 18.60c
Old Dominion Paper Co. .....
(50,000 lbs. only) 18.987c
(50,000 lbs. only) 19.487c
(50,000 lbs. only) 19.986c
Carpenter Paper Co. .....
(40,000 lbs. only) (Feb.) 18.60c

No. 77—40,000 lbs., white, No. 18; rolls, 24 ins. wide (3-inch fiber cores).
Paper Corp. of U. S. 18.72c

No. 78—150,000 lbs., blue, cherry, green, pink, salmon and yellow, No. 18; flat, cut 21x32, 22x34, and 28x34 ins.; the grain to run the 21-inch way on the 21x32-inch size. Min. order, one color, 5,000 lbs.
Collins Mfg. Co. .....
(100,000 lbs. only) 19.90c
Barton, Duer & Koch Paper Co. 18.95c
Bermingham & Prosser Co. .....
(50,000 lbs. only) 19.60c
(50,000 lbs. only) 19.70c
(50,000 lbs. only) 20.10c
Old Dominion Paper Co. .....
(50,000 lbs. only) 19.749c

100 Per Cent White Manifold

No. 84—40,000 lbs., No. 18; flat, cut 32x42 ins.; the grain to run the 42-inch way. Min. order 5,000 lbs.
R. P. Andrews Paper Co. 29.90c
Barton, Duer & Koch Paper Co. 27.30c
Chicago Paper Co. 28.65c
Old Dominion Paper Co. 31.93c

50 Per Cent White Glazed Manifold

No. 85—150,000 lbs., No. 16; flat, cut 28x34 ins.; the grain to run the 28-inch way. Min. order 20,000 lbs.
R. P. Andrews Paper Co. .....
(40,000 lbs. only) 22.66c
Barton, Duer & Koch Paper Co.
(75,000 lbs. only) 21.25c
(75,000 lbs. only) 22.25c

Chemical Wood Bond, White and Colored

No. 101—500,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 38 ins.
Eastern Corp. 11.46c
Cauthorne Paper Co. 9.60c
Barton, Duer & Koch Paper Co.
(150,00 lbs. only) 9.90c
Aetna Paper Co. .....
(200,000 lbs. only) 10.43c

No. 102—2,000,000 lbs., No. 32; flat, cut any size, min. width 21 ins.; max. width 38 ins.
Eastern Corp. 9.31c
Cauthorne Paper Co. 7.87c

No. 103—200,000 lbs., blue, buff, green, pink, salmon, and yellow, No. 26; flat, cut any size, min. width 21 ins., max. width 38 ins. Min. order, one color, 5,000 lbs.
Aetna Paper Co. 11.31c

25 Per Cent Bond, White and Colored

No. 105—400,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins.; max. width 48 ins.
Ris Paper Co., Inc. .....
(100,000 lbs. only) 14.35c
Whitaker Paper Co. 15.48c
Aetna Paper Co. .....
(200,000 lbs. only) 15.67c
(200,000 lbs. only) 15.87c

No. 106—2,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
R. P. Andrews Paper Co. .....
(50,000 lbs. only) 14.35c
Collins Mfg. Co. .....
(50,000 lbs. only) 13.95c
(100,000 lbs. only) 14.25c
Central Ohio Paper Co. 14.35c
Cauthorne Paper Co. .....
(100,000 lbs. only) 14.35c
Barton, Duer & Koch Paper Co.
(180,000 lbs. only) 14.45c
Whitaker Paper Co. .....
(500,000 lbs. total; Lots 106, 107 and 108) 13.86c
(50,000 lbs. total. Lots 106, 107 and 108) 14.35c
McIntosh Paper Co. .....
(Total tonnage 100,000 lbs. Lots 106, 107 and 108) 14.35c
Whitehead and Alligar Co., Inc.
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Aetna Paper Co. .....
(500,000 lbs. only) 14.12c
Wilcox, Walter, Furlong Paper Co.
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Messinger Paper Co. .....
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c

No. 107—1,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Collins Mfg. Co. .....
(50,000 lbs. only) 13.95c
(100,000 lbs. only) 14.25c
Cauthorne Paper Co. .....
(100,000 lbs. only) 14.35c
Tobey Fine Papers, Inc. .....
(100,000 lbs. only) 14.35c
Whitaker Paper Co. .....
(500,000 lbs. total. Lots 106, 107 and 108) 13.86c
(50,000 lbs. total. Lots 106, 107 and 108) 14.35c
McIntosh Paper Co. .....
(Total tonnage 100,000 lbs. Lots 106, 107 and 108) 14.35c
Whithead and Alligar Co., Inc. ..
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Aetna Paper Co. .....
(500,000 lbs. only) 14.12c
Wilcox, Walter, Furlong Paper Co.
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Messinger Paper Co. .....
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c

No. 108—1,500,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Collins Mfg. Co. .....
(50,000 lbs. only) 13.95c
(100,000 lbs. only) 14.25c
E. E. Lloyd Paper Co. .....
(50,000 lbs. only) 14.35c
Baxter Paper Co. .....
(100,000 lbs. only) 14.45c
Whitaker Paper Co. .....
(500,000 lbs. only. Lots 106, 107 and 108) 13.86c
(50,000 lbs. total. Lots 106, 107 and 108) 14.35c
McIntosh Paper Co. .....
(Total tonnage 100,000 lbs. Lots 106, 107 and 108) 14.35c
Whitehead & Alligar Co., Inc. ..
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Aetna Paper Co. .....
(500,000 lbs. only) 14.12c
Wilcox, Walter, Furlong Paper Co.
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c
Messinger Paper Co. .....
(100,000 lbs. total. Lots 106, 107 and 108) 14.35c

No. 109—80,000 lbs., yellow, No. 26; flat, cut 34x44 ins. Min. order 5,000 lbs.
R. P. Andrews Paper Co. 18.65c
Aetna Paper Co. 16.27c

No. 110—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Collins Mfg. Co. .....
(50,000 lbs. only) 14.10c
(50,000 lbs. only) 14.55c
(50,000 lbs. only) 14.85c
Aetna Paper Co. 14.47c

No. 111—400,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Collins Mfg. Co. .....
(50,000 lbs. only) 14.10c
(50,000 lbs. only) 14.55c
(50,000 lbs. only) 14.85c
Aetna Paper Co. 14.47c

100 Per Cent White Bond

No. 128—10,000 lbs., Nos. 32 and 40; flat, cut any size, min. width 16 ins., max. width 32 ins. Min. order, one substance, 2,000 lbs.
R. P. Andrews Paper Co. 24.25c
Paper Corp of US 22.90c
Barton, Duer & Koch Paper Co. . 22.90c
Stanford Paper Co. 24.25c

Chemical Wood White Ledger

No. 151—250,000 lbs., No. 48, flat, cut any size, min. width 17 ins., max. width 48 ins.
Eastern Corp. 9.60c

No. 152—150,000 lbs., No. 56; flat, cut any size, min. width 17 ins., max. width 48 ins.
Eastern Corp. 9.60c

No. 153—150,000 lbs., No. 48; rolls, 34 and 48 ins. wide (3-inch fiber cores).
Eastern Corp. 9.36c
Wilcox, Walter, Furlong Paper Co. 7.78c

25 Per Cent Ledger, White and Colored

No. 154—500,000 lbs., white, No. 48; flat, cut 22x34, 24x38, 28x34, 32x42 and 34x44 ins. Min. order, one substance, 5,000 lbs.
Collins Mfg. Co. .....
(50,000 lbs. only) 13.52c
(50,000 lbs. only) 14.10c
Mudge Paper Co. .....
(50,000 lbs. only) 14.40c
Walker, Goulard Plehn Co. ....
(100,000 lbs. only) 14.35c
Aetna Paper Co. .....
(100,000 lbs. only) 13.93c

No. 155—200,000 lbs., white, No. 56; flat, cut 22x34, 24x38, 28x34, 32x42 and 34x44 ins. Min. order, 5,000 lbs.
Collins Mfg. Co. .....
(50,000 lbs. only) 13.52c
(50,000 lbs. only) 13.97c
Mudge Paper Co. .....
(100,000 lbs. only) 14.40c
Aetna Paper Co. .....
(100,000 lbs. only) 13.93c
Merriam Paper Co. .....
(200,000 lbs. only) 14.25c

No. 156—200,000 lbs., blue, buff, green, pink, salmon and yellow, No. 56; flat, cut 24x38, 28x34, and 34x44 ins. Min. order, one substance, one color, 5,000 lbs.
Collins Mfg. Co. .....
(50,000 lbs. only) 14.12c
(100,000 lbs. only) 14.90c

100 Per Cent White Ledger

No. 176—8,000 lbs., No. 48; flat, cut 24x38, 28x34, and 32x42 ins. Min. order, 4,000 lbs.
R. P. Andrews Paper Co. 26.25c
Paper Corp. of US 21.74c
Barton, Duer & Koch Paper Co. 20.70c
Stanford Paper Co. 26.00c

No. 177—30,000 lbs., No. 64; flat, cut 24x38, 28x34, and 32x42 ins. Min. order, 5,000 lbs.
R. P. Andrews Paper Co. 26.25c
Paper Corp of US 20.74c
Barton, Duer & Koch Paper Co... 20.65c
Stanford Paper Co. 26.00c

Chemical Wood White Index

No. 183—300,000 lbs., 22½x28½—148; flat, cut any size, min. width 17 ins., max. width 42 ins.
Wilcox, Walter, Furlong Paper Co. 7.99c

(Continued on page 24)

FASTER MANEUVERABILITY WITH FAWICK CLUTCHES

Perfect Performance

This revolutionary new clutch controls power by air. It is economical. It always works. It needs no arms, levers or toggles. It requires no lubrication or adjustments. Maintenance cost is exceptionally low.

The Fawick Airflex Clutch and Brake has earned its place in heavy-duty service where there is no room for failure. Hundreds are in use on new Navy and Merchant Marine vessels because, more than any other clutch, they permit faster maneuverability — faster starts, quicker stops.

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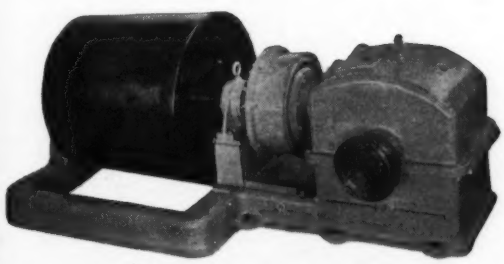


For Paper Mill Drives

Airflex Clutch is self-aligning, shock-absorbing and air-cooled. Smooth in operation—powerful enough to break away a balky dryer section. No moving parts—no bearings to lubricate.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. Cleveland 11, Ohio
In Britain, Crofts Engineers, Ltd., Bradford, England

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

JOINT PRINTING COMMITTEE OPENS PAPER BIDS

(Continued from page 22)

No. 184—1,000,000 lbs., 22½x28½—182 and 230; flat, cut 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Tobey Fine Papers, Inc. .....
(200,000 lbs. only) 7.24c
Whitaker Paper Co. 7.67c
McIntosh Paper Co. .....
(200,000 lbs. only) 7.25c
Stanford Paper Co. .....
(200,000 lbs. only) 7.24c
Wilcox, Walter, Furlong Paper Co.
(250,000 lbs. only) 7.99c
MacCollum Paper Co., Inc. .....
(200,000 lbs. only) 7.24c

50 Per Cent Index, White and Colored

No. 189—100,000 lbs., white, 22½x28½—148; flat, cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

R. P. Andrews Paper Co. 11.97c

No. 190—500,000 lbs., white, 22½x28½—182 and 230; flat, cut 24x38, 28x34, 32½x42, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one weight, 10,000 lbs.

Walker Goulard Plehn Co. .....
(100,000 lbs. only) 15.40c

No. 191—700,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, 22½x28½—182 and 230; flat, cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

Barton, Duer & Koch Paper Co. ..
(200,000 lbs. only) 15.75c

No. 192—150,000 lbs., blue, buff, cherry, fawn, green, pink, salmon and yellow, 22½x28½—148; flat, cut 24x38, 28x34, and 34½x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, one weight, 5,000 lbs.

R. P. Andrews Paper Co. 12.47c

100 Per Cent White Index

No. 195—20,000 lbs., 22½x28½—148; flat, cut 24x38, 28x34, and 32x42 ins.

R. P. Andrews Paper Co. 25.80c
Paper Corp. of US 20.75c
Barton, Duer & Koch Paper Co. . 20.20c

No. 196—100,000 lbs., 22½x28½—approximately 206; flat, cut 20½x30½ and 34½x44 ins.

R. P. Andrews Paper Co. 25.80c
Paper Corp. of US 20 25c
Barton, Duer & Koch Paper Co. . 20.20c

Coated Cover, White and Colored

No. 201—25,000 lbs., white, 20x26—120; flat, 26½x41 ins., the grain to run lengthwise of the sheet. Min. order, 5,000 lbs.

No bids

No. 202—20,000 lbs., India tint and light green, 20x26—100; flat, 26½x41 ins. Min. order, 5,000 lbs.

No bids

Antique-Finish Cover, White and Colored

No. 203—300,000 lbs., antique; white, blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea and yellow; flat, 19½x25¼—95, with projecting colored-paper marker between each 500 sheets. Min. order, one color, 5,000 lbs.

R. P. Andrews Paper Co. 8.21c
Marquette Paper Corp. 8.93c
Whitaker Paper Co. 8.32c
Stanford Paper Co. .....
(200,000 lbs. only) 8.93c

50 Per Cent Laid Cover, Colored

No. 205—100,000 lbs., blue, cream, white, gray and green, 20x26—130; flat, cut 19½x25¼ ins., in wrapped bundles with projecting colored-paper marker between each 500 sheets. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co. 12.10c
Whitaker Paper Co. 13.23c

Wood Manila

No. 208—80,000 lbs., 24x36—80 and 100; flat, cut 25x38 and 32x42 ins., with projecting colored-paper marker between each 500 sheets.

Walker Goulard Plehn Co. 5.65c
Whitaker Paper Co. 5.65c
Frank Parsons Paper Co. 5.25c

No. 209—200,000 lbs., 24x36—80 and 100; rolls, 21 and 36 ins. wide (3-inch fiber cores).

Bulkley, Dunton & Co. 4.75c
Walker Goulard Plehn Co. 5.25c
Frank Parsons Paper Co. 4.75c

No. 210—40,000 lbs., 24x36—120; rolls, 18-ins. diameter, 4¼, 5¾, and 7½ ins. wide, wound on wooden plugs, 1½-in. hole.

Walker Goulard Plehn Co. 6.25c
Whitaker Paper Co. .....
(4¼ inch rolls) 5.875c
(5¾ and 7½ inch rolls) 5.625c

Chemical Wood Manila

No. 211—40,000 lbs., 24x36—140 and 160; flat, cut any size. Min. order, one weight, 5,000 lbs.

No bids

Hemp and/or Jute Manila

No. 213—40,000 lbs., 24x36—160 and 280; rolls, 48 ins. wide (3-inch fiber cores). Min. order, 5,000 lbs.

R. P. Andrews Paper Co. .. ..
(160 lb.) 18.25c
(280 lb.) 17.25c
Paper Corp. of US 20.50c
Perkins-Goodwin Co. 18.50c

No. 2 Kraft

No. 219—80,000 lbs., 24x36—80 to 160, rolls, minimum width 9 ins., maximum width 48 ins., wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

R. P. Andrews Paper Co. 4.65c

Imitation Kraft

No. 220—50,000 lbs., 24x36—80 to 160; flat, cut any size; in wrapped bundles.

No bids

No. 221—50,000 lbs., 24x36—80 to 160; cut any size, folded (25 sheets per fold); in wrapped bundles.

No bids

No. 222—80,000 lbs., 24x36—80 to 160; rolls, min. width 9 ins., max. width 48 ins., wound on wooden plugs, 1½-inch hole or on 3-inch fiber cores as may be specified.

No bids

White Gummed

No. 252—500,000 sheets, flat, 22x34 ins. Min. order, 25,000 sheets.

Graham Paper Co. .....
Per M sheets..$14.65
Carpenter Paper Co. .....
Per M sheets (sample)..$14.43
Bulkley, Dunton & Co. .....
Per M sheets..$14.62
Eureka Specialty Printing Co. ..
Per M sheets..$14.80
Barton, Duer & Koch Paper Co. .
Per M sheets..$14.92
Whitaker Paper Co. .....
Per M sheets..$14.62
Stanford Paper Co. .....
Per M sheets..$14.62

25 Per Cent Blotting, White and Colored

No. 254—20,000 lbs., white, flat, 19x24—160, in wrapped bundles. Min. order, 10,000 lbs.

R. P. Andrews Paper Co. 8.47c
Mudge Paper Co. 9.50c
Swigart Paper Co. 12.50c
Bulkley, Dunton & Co. 12.50c
Central Ohio Paper Co. 8.77c
Mathers-Lamm Paper Co. 9.39c
Butler Co. 8.77c
Cauthorne Paper Co. 9.50c
Barton Duer & Koch Paper Co. . 12.50c
Whitaker Paper Co. 9.89c
Bradner, Smith & Co. 8.77c
Stanford Paper Co. 8.77c
Virginia Paper Co. 9.50c
Old Dominion Paper Co. 9.49c

No. 255—100,000 lbs., buff, salmon and moss green; flat, 19x24—160, in wrapped bundles. Min. order, one color, 2,000 lbs.

R. P. Andrews Paper Co. 9.21c
Mudge Paper Co. 10.00c
Swigart Paper Co. 13.75c
Paper Corp. of US 13.75c
Central Ohio Paper Co. ..(buff) 9.15c
(salmon) 9.02c
(moss green) 9.46c
Mathers-Lamm Paper Co. 9.845c
Butler Co. .....(buff) 9.15c
(salmon) 9.02c
(moss green) 9.46c
Cauthorne Paper Co. 10 00c
Barton, Duer & Koch Paper Co. . 13.75c
Whitaker Paper Co. 10.23c
Bradner, Smith & Co. ....(buff) 9.15c
(salmon) 9.02c
(moss green) 9.46c
Stanford Paper Co. .....(buff) 9.15c
(salmon) 9.02c
(moss green) 9.46c
Virginia Paper Co. 10.00c
Old Dominion Paper Co. 9.947c

High-Finish Red Sulphite

No. 265—20,000 lbs. flat, 24x36—320, in wrapped bundles. Min. order, 5,000 lbs.

Mudge Paper Co. 8.25c
Paper Corp of US 8.43c

High-Finish Chemical Wood Manila Tag

No. 271—100,000 lbs., 24x36—280; flat, cut any size, min. width 24 ins., max. width 38 ins.

Paper Corp of US 9.50c

Calendered Tag, Manila and Colored

No. 276—1,000,000 lbs., manila, 22½x28½—150; rolls, 23¼ and 26½ ins. wide (6-inch fiber cores with metal tips).

Barton, Duer & Koch Paper Co. . 8.50c
Perkins-Goodwin Co. ... .
(200,000 lbs. only) 10.50c

No. 277—100,000 lbs., blue, brown, green, ivory, pink, red, salmon and yellow, 22½x28½—150; rolls 23¼ and 26½ ins. wide (6-inch fiber cores with metal tips). Min. order, one color, 10,000 lbs.

Barton, Duer & Koch Paper Co. 9.50c
Perkins-Goodwin Co. ... .
(50,000 lbs. only) 11.50c

Jute Tag

No. 280—100,000 lbs., 22½x28½—200 and 280; flat, cut 28x38 ins. Min. order, one weight, 10,000 lbs.

Mudge Paper Co. 11.25c
Perkins-Goodwin Co. 12.00c

Railroad Board, White and Colored

No. 302—150,000 sheets, white, flat, 22x34 ins., 4-ply, each 100 sheets fully banded. Min. order, 10,000 sheets.

Bulkley, Dunton & Co. .....
(per M sheets)..$34.38
Barton, Duer & Koch Paper Co...$45.60
Bradner, Smith & Co. $34.37
Stanford Paper Co. $34.38
Old Dominion Paper Co. $33.94

No. 303—40,000 sheets, white, flat, 22x34 ins., 8-ply each 100 sheets fully banded. Min. order, 5,000 sheets.

Bulkley, Dunton & Co. (per M sheets)	$49.46
Barton, Duer & Koch Paper Co.	$49.40
Bradner, Smith & Co.	$48.01
Stanford Paper Co.	$49.46
Old Dominion Paper Co.	$48.84

No. 304—20,000 sheets, white, flat 22x34 ins., 14-ply, each 50 sheets fully banded. Min. order, 5,000 sheets.

Paper Corp. of U. S. (per M sheets)	$72.65
Barton, Duer & Koch Paper Co.	$72.50
Bradner, Smith & Co.	$71.53
Stanford Paper Co.	$72.68
Old Dominion Paper Co.	$71.74

No. 305—40,000 sheets, ash gray, green, orange and red, flat, 22x34 ins., 4-ply, each 100 sheets fully banded. Min. order, one color, 5,000 sheets.

Bulkley, Dunton & Co. (per M sheets)	$43.04
Barton, Duer & Koch Paper Co.	$43.00
Bradner, Smith & Co.	$42.78
Stanford Paper Co.	$43.04
Old Dominion Paper Co.	$42.49

Wood Bristol, Colored

No. 306—250,000 lbs., buff, 22½x28½—150; rolls, 20 ins. wide (6-inch iron cores).

Central Ohio Paper Co. (150,000 lbs. only)	5.50c
(100,000 lbs. only)	5.75c
Barton, Duer & Koch Paper Co.	5.50c
Frank Parsons Paper Co.	5.50c

No. 307—50,000 lbs., mellon, flat, 20x30—172; in wrapped bundles with projecting colored-paper marker between each 100 sheets.

Walker Goulard Plehn Co.	6.15c
Barton, Duer & Koch Paper Co.	6.25c

No. 308—200,000 lbs., blue, buff, gray, green, mellon, pink and yellow, 22½x28½—184; rolls, 20 ins. wide (6-inch iron cores).

Walker Goulard Plehn Co.	6.00c
Barton, Duer & Koch Paper Co.	6.00c

United States Postal Card Bristol

No. 325—1,500,000 lbs., 22½x28½—188; rolls, 22 and 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. (Total 1,800,000 lbs. on lots 325, 326 and 327)	5.97c
Whitaker Paper Co. (Maximum 3,000,000 lbs. Lots 325, 326 and 327)	5.91c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.01c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.09c

No. 326—1,000,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diameter and 33 ins. wide, 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. (Total 1,800,000 lbs. on lots 325, 326 and 327)	5.97c
Whitaker Paper Co. (Maximum 3,000,000 lbs. Lots 325, 326 and 327)	5.91c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.01c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.09c

No. 327—1,000,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 30 ins. in diamter, 33 ins. wide and 36 ins. in diameter (6-inch iron cores).

R. P. Andrews Paper Co. (Total 1,800,000 lbs. on lots 325, 326 and 327)	5.97c
Whitaker Paper Co. (Maximum 3,000,000 lbs. Lots 325, 326 and 327)	5.91c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.01c
(Maximum 3,000,000 lbs. Lots 325, 326 and 327)	6.09c

Pressboard, Colored

No. 351—25,000 sheets, red, flat, 24x32 ins., thickness .0140 inch. Min. order, 5,000 sheets.

R. P. Andrews Paper Co. Per C sheets..	$7.51
Resolute Paper Products Corp. Per C sheets..	$7.74
Mathers-Lamm Paper Co. Per C sheets..	$7.70
Barton, Duer & Koch Paper Co. Per C sheets..	$7.75
Whitaker Paper Co. Per C sheets..	$7.20
Old Dominion Paper Co. Per C sheets..	$7.549

No. 352—20,000 sheets, gray, flat, 30x36 ins., thickness .0300 inch. Min. order, 5,000 sheets.

R. P. Andrews Paper Co. Per C sheets..	$23.59
Resolute Paper Products Corp. Per C sheets..	$24.39
Mathers-Lamm Paper Co. Per C sheets..	$24.79
Barton, Duer & Koch Paper Co. Per C sheets..	$18.85
Bird & Son, Inc. Per C sheets..	$18.85
Whitaker Paper Co.	$23.16
Old Dominion Paper Co.	$24.298

News Board

No. 360—1,000,000 lbs., 26x38 ins., No. 100, flat, cut any size, min. 21x32 ins., max. 40x52½ ins (to be trimmed square on four sides).

R. P. Andrews Paper Co.	2.779c
Mudge Paper Co.	2.763c
Stanford Paper Co.	2.75c

Binder's Board, No. 1 Quality

No. 366—600,000 lbs., flat, to trim 25x30 ins., Nos. 16, 18, 20, 25, 30 and 40.

Mathers-Lamm Paper Co. (440,000 lbs.)	4.135c

No. 367—50,000 lbs., 25¾x30¼ ins., Nos. 12 and 20; flat, to trim 34x44 ins.

No bids

Binder's Board Best Quality

No. 368—40,000 lbs., flat, to trim 20x30 ins., and 22x28 ins., Nos. 18, 20, 25, 30, 35, 40 and 45. Min. order, 5,000 lbs.

Consolidated Paper Co. (carload lots)	5.40c
(less than carload lots)	5.87c

To Use Less Printing Paper

WASHINGTON, D. C., December 8, 1943—The War Production Board's Commercial Printing and Lithographing Industry Advisory Committee has recommended that the industry operate in 1944 on 75 per cent of the print paper used in 1941, Philip S. Schneider, assistant director of the WPB Printing and Publishing Division, announced today. This recommendation to curtail the use of commercial printing paper was made after the representatives of the printing and lithographic industries were fully informed as to the seriousness of the present paper situation, said Mr. Schneider, who acted as Government presiding officer during the meeting.

The reason behind the paper shortage and the problem facing the industry were outlined in detail by Harold Boeschenstein, acting director of the Forest Products Bureau, and Rex Hovey, director of the Paper Division of the War Production Board.

The Advisory Committee urged that every person in the industry back the waste paper drive. Mr. Hovey emphasized the problem facing the people of the United States in increasing waste paper collections 20 per cent above present levels. He also pointed out that if waste collections can be increased by about 200,000 tons a month, the fear of further reductions in use of paper may be eliminated.

"It is not an impossible job to do this," said Mr. Hovey, "but it will take the cooperation of every printer in the country from the largest to the smallest."

The committee also urged that every printer and buyer of printing, small or large, eliminate for the duration French folds, overhang covers, bleed pages, blank interleaving pages and other "fancy" uneconomical uses of paper.

Byron Weston Personnel Changes

Hale Holden, Jr., president of the Byron Weston Company, Dalton, Mass., has announced the following mill appointments, effective January 1, 1944. These are brought about by this company's war activities in the specialty paper field and the thought that many of these activities will be carried on from a postwar standpoint.

Walter G. Hendrich is appointed director of research and development, and will be in charge of all development work in the field of new products, methods and equipment.

G. L. Giddings is being transferred to the home office from the Pacific Coast, to devote his entire time to sales and contact work in the specialty and new products field, working in cooperation with Mr. Hendrich.

Leonard P. Taylor is appointed general mill superintendent, and will have charge of manufacturing and the mill organization.

Fritz S. Klein is appointed technical superintendent, and will have charge of the control laboratory, with supervision over production quality.

Arthur L. Simpson is appointed superintendent and chief engineer of the power plant.

Kimberly-Clark Aid the War

How the products of research and invention by the Kimberly-Clark Corporation, Neenah, Wis., have played an important part in the war effort has been revealed for the first time.

Kacelite, a laminating and molding paper, effects considerable savings of a vital plastic by using reclaimed fabric materials. Kacetev makes a portable delousing bag of water resistant light weight fabric lined with plasticized, impregnated crepe cellulose wadding impregnable to methyl bromide gas. A toxic capsule when crushed inside the bag exterminates all vermin in clothing placed inside.

Kacetex substitutes for metal as a tough, flexible bag used as a gasoline container, especially adaptable when borne on the shoulder over rough terrain. It is made of water resistant material on the outside and lined with Kacetex gasoline-proof impregnated crepe cellulose wadding. The product can also be used for balloons for aircraft gunner practice.

Expendable rain capes, tarpaulins and thermovests are made from the impregnated creped cellulose, and Kacetex finds extensive usage as the ideal material for camouflage, as it resists fire, water, mold and mildew, weight and infra-red photography.

Another item is Kimpreg, applied to plywood to increase the rigidity of the panel and give it a nonsplintering, smooth, scuff-proof surface. It is suitable for military luggage, surfaced flooring and other purposes.

Kaceline laminating and molding papers are being used for navy megaphones and aircraft ammunition boxes. An extensive amount of a standard product, Kimpack, also is being used as padding for many types of war shipments to prevent damage.

These products are all additional to the company's contribution through its ordnance division which produces mounts for the Maxson anti-aircraft gun, cylinders for landing gear for bombers, cargo winches, water-cooled bolts for carbon furnaces, hook swivels for chain hoists, stainless plunger tubes for chemical warfare equipment, and numerous others.

Falk Corp. Changes

The Falk Corporation, Milwaukee, Wis., manufacturers of herringbone and helical gears, speed reducers, heavy drives, flexible couplings, and steel castings, announces the appointment of Thomas F. Scannell as general sales manager. In his new capacity Mr. Scannell will be responsible for the sale of all Falk products, including steel castings. Prior to his new appointment, Mr. Scannell was sales manager for all Falk products with the exception of those coming under the jurisdiction of the foundry division.

Heretofore foundry sales and operations have been under the direct supervision of Arthur Simonson, vice president, who has specialized in steel foundry production and sales with the Falk Corporation for the past 35 years. Following his technical education and industry training in England, he commenced work with us in 1909 and was engaged in steel making and metallurgy until 1916 when he was transferred to steel foundry sales. He became vice president in charge of foundry sales in 1927 and vice president in charge of all foundry operations in 1938.

John S. Wilkinson, who has been connected with the Falk foundry in various capacities for many years, will function as assistant sales manager in charge of foundry sales.

Mr. Scannell is a Yale alumnus, class of 1918, and served as Ensign in the United States Navy during the world war. After a number of years with the Chain Belt Company of Milwaukee, he joined the Falk organization in 1928 and has been successively St. Louis Representative and District Manager of the southwest territory with headquarters in Dallas. In April, 1940, he was transferred to Milwaukee, being appointed sales manager for all except foundry products in June of 1941. He is active in the affairs of the American Gear Manufacturers Association and holds memberships in the American Petroleum Institute, the American Society of Naval Engineers, and the American Society of Naval Architects and Marine Engineers.

Timken Roller Bearing Changes

Donald S. Klippert has been appointed assistant general manager of sales of the Timken Steel and Tube Division, according to a recent announcement of The Timken Roller Bearing Company, Canton, Ohio. Klippert had been Cleveland District Manager of the Timken Steel and Tube Division.

Appointment of Robert P. Donnell to succeed Klippert as Cleveland district manager was made at the same time. Donnell has been a Timken Steel and Tube Division Metallurgical Engineer specializing in aircraft applications for the past six years.

Klippert spent two years at Mount Union before attending the Case School of Applied Science in Cleveland where he received a B. S. Degree in Mechanical Engineering, an M. S. Degree in Metallurgical Engineering, and later the professional degree of Metallurgical Engineer. He has been associated with the Timken Company for eight years, having spent four years in Milwaukee and Chicago, in addition to four years as Manager of the Cleveland District.

Donnell, who was graduated from Susquehanna University with a B. S. Degree in Chemistry and Metallurgy, spent two years as chief matallurgist of the White Motor Car Company of Cleveland, Ohio, and for six years prior to that was in charge of Metallurgy for the Lycoming Division of Aviation Manufacturing Corporation.

Paper Makers' Directory

The fifty-second annual edition for 1943 of the Paper Makers' Directory of All Nations, has been published by the Odhams Press, Ltd. This latest issue contains lists of mills and distributors in Germany, Italy, and Japan, as in 1942, without material alteration, due to war conditions. The volume contains the same comprehensive and convenient listings of mills, converting plants, paper merchants, stationers, manufacturers of equipment, suppliers of materials and also much useful trade information.

Copies are 25 shillings, net and may be obtained from the office of the directory at 30 Bedford street, Strand, London, W.D.W., England.

The High Quality and Dependable Uniformity of

DIAMOND ALKALIES

Mean Faster Production, Better Results

The smooth, speedy production of many vital war materials is aided by the dependable uniformity of Diamond Alkalies.

In the cleaning and de-greasing of metal parts, in the manufacture of TNT and nitroglycerine, in the preparation of food products for the armed forces, in the scouring of raw wool used for uniforms and blankets, in the manufacture of aluminum, and other products needed for war material, the high quality and uniformity of Diamond Alkalies mean better results and faster output.

In products normally made for civilian use but now required in large quantities for war service—products such as glass, leather, paper, rubber—experienced plant operators naturally turn to Diamond for their alkalies. With vital war needs demanding faster and faster production, they want the alkalies they know to be pure, uniform and satisfactory in every way.

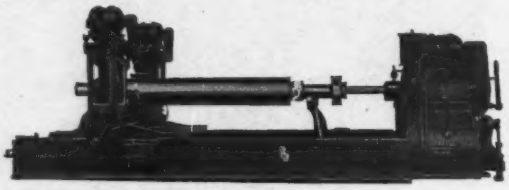
To meet this increased demand, our system of Controlled Manufacture, developed during peace times, enables us to maintain highest quality while achieving maximum production.

ALKALI

DIAMOND ALKALI COMPANY • Pittsburgh, Pa., and Everywhere

★ LOBDELL ★

The ROLL GRINDER that Provides Every Feature Needed!



Here are some of the more important features—many of them exclusive Lobdell developments:

★ **AUTOMATIC CROWNING DEVICE** (patented) One simple setting produces any desired crown. No gears, cams or formers to change.

★ **AUTOMATIC GRINDING WHEEL IN-FEED** (patented) Automatically compensates for wheel wear . . . eliminates need for operator's constant attention . . . maintains uniform grinding pressure . . . reduces wheel wear and speeds up the grinding operation. Simple thumbscrew adjustment determines rate of feed.

★ **MULTIPLE V-BELT DRIVES TO WHEELS** through jack-shaft, from dynamically balanced motors mounted directly over the grinding wheels. This design transmits minimum vibration to wheels and permits unobstructed placing of rolls in machine from overhead crane or hoist.

★ **PROVISION FOR LEVELING THE BED** to maintain accurate alignment of the ways regardless of wear or changes in the foundation.

★ **SELF-CONTAINED GEARED HEAD** Motor mounted on head drives through multiple V-belt drive and friction clutch. Herringbone gears used in final drive to eliminate noise and vibration.

★ **CIRCULATING OILING SYSTEM** pumps filtered oil to all principle bearings, gears and traverse screw.

★ **TRAVERSE SCREW FULLY PROTECTED** from water or grit by a cover extending its full length. Screw runs in constantly renewed oil bath.

★ **SAFETY FEATURES** include completely enclosed gearing, safety chucks, hold-back and driving bar having no projecting parts to catch the operator's clothing.

LOBDELL

COMPANY • Wilmington 99 • Delaware

Also makers of Lobdell Calender Stacks, Lobdell Micrometer Roll Calipers and Lobdell "Puraloy" Rolls.

Deinking*

By Ronald Hynes[1]

Abstract

The process for deinking waste papers is discussed with specific reference to the operation of a commercial installation.

Any discussion of deinking must, of course, be predicated on the economic aspect of the reuse of old papers. When virgin pulp is available, then the cost per ton of bleached deinked stock must be such that there is a marked savings in the use of this type of stock. At the present time, because of the shortage of labor in the woods which has resulted in a shortage of available wood pulp, the subject of deinking is timely.

There are probably as many deinking systems as there are people thinking about deinking. Each person may feel that his chemicals or his equipment has the edge on others but the only measuring stick is, of course, the quality of the finished stock. Among the many materials used as deinking chemicals are caustic soda, lime, soda ash, rosin soap, bentonite, tetrasodium pyrophosphate, sodium metasilicate and combinations of these materials. Also, included in patents are systems using solvents for extraction which later can be recovered; although no one has such a system in actual use. In all cases, the object is the same: to remove the ink by saponification of the vehicles or by mechanical agitation in the presence of a chemical, and hold it in such a manner as to have it wash freely from the stock.

The equipment used may be a beater or beaters, pulpers, cook tanks or digesters, or any piece of available equipment around a mill. The system will be evolved from such a unit. In general, it is good practice to operate the system so that it will use as high consistencies, as low alkalinity, and as low temperature as possible and still defiber the paper thoroughly.

It is reasonable to be sure the paper entering the system is of a standard quality, some mills buy sorted paper and others sort the paper themselves, in either case, good paper going into the system will result in clean stock, while poor or dirty paper will result in dirty stock. Carbon, asphalt, and waxed paper, glassine and cellophane, heavy kraft wrappings and chipboard are the most obvious on the list to throw out. Carbon, asphalt, and wax papers may defiber to some extent or possibly completely, but there will usually be small pellets or balls of carbon, asphalt, or wax adhering to the fibers which often will remain as very fine particles and agglommerate when in the beater with size and alum.

At the present time, groundwood papers are being included up to 20% in No. 1 magazine stock and because of this there has been quite a lot of activity relative to the deinking groundwood papers. Those papers which do not include newsprint are handled as a separate stock, and can be deinked fairly satisfactorily. However papers such as "Time," "Life," "Detective," "True Story," etc. containing up to 60 to 70% groundwood are the ones to which interest is

* Presented at the Technical Association of the Pulp and Paper Industry and Superintendents' Association Meeting, Queensbury Hotel, Glens Falls, N. Y., Dec. 3, 1943.

[1] Member TAPPI; Superintendent, Newton Falls Paper Co., Newton Falls, N. Y.

being paid. These are printed with a special type of ink and have sufficient hardness of stock to cause some difficulty in deinking and defibering. Here, especially, care must be taken to keep the alkalinity and temperature low to avoid degradation and poor color.

In our particular installation we use a short conveyor belt to carry the paper to a six cylinder railroad duster. Shredded paper then enters two pulpers at which point chemicals and hot water are added. The operator is responsible for maintaining high consistency at this pulping point. The stock is then batched into cook tanks for finishing. The cook observes the progress of defibering by sampling and can add chemicals when necessary. The finished stock is dropped into a chest and pumped through a riffler box and rag catcher after which it is screened through .012 cut chromium plated plates. The rejected stock goes to a tail screen and rejects are thrown out, here the accepted stock going to the raw stock chest for rescreening. The accepted stock from the first screens goes to a vacuum type of washer, stock breakers and two more decker type washers. Bleach liquor is added and the stock goes to a continuous bleaching chest after which it is again washed and pumped to the paper mill.

Our average production is about 45 tons per 24 hours with a maximum of 55 tons. We employ a foreman, three paper handlers, two cooks and a screen man on every shift. This brings the labor cost to an average of $4.90 per ton. Our horsepower consumptoin averages 17 horsepower per ton per 24 hours.

Our chemical cost runs in the neighborhood of $3.00 per ton but lately because of experimental work it has been considerably higher. Our bleaching cost runs around 60c per ton. These costs will increase with the increase in per cent of groundwood stock in the paper to be deinked.

In the past few months new chemicals have been offered for deinking groundwood and while some of them show promise, it is probably too soon to either condemn or recommend any of them. It would seem logical to conclude that they must have some merit and are worthy of investigation by anyone in the deinking field.

At the present time the waste paper supply is short but according to information on the current waste paper salvage campaign, the situation appears to be easing somewhat. The waste paper is available if all of us will get it out of our cellars and attics and into the proper channels for shipping to mills where it can be reprocessed.

Ever Been Beaten by a Drum?

This is the question National Adhesives asks their customers in an attractive, two-color mailing piece, which shows how to make metal drums last longer and which urges the trade to return empties (barrels too) promptly.

National sums up its message to customers this way —"You want your orders shipped without unnecessary delay, but we cannot ship . . . certainly not on time . . . if we do not have the proper packages. When you hold up drums (and barrels), you hold up the war effort, so please return empties promptly.

Other suppliers who are confronted with the same problem may obtain permission to copy part or all of National's effective approach to the problem, by addressing their New York headquarters.

OUR foundry has been developed for large volume production of fine castings. Nearly all of today's output goes to help speed the day of total victory for the United Nations. When production for peace is again possible, our foundry will be ready to give the Paper Industry fast service on castings of the highest quality.
Appleton Paper Mill Equipment is sold in the Atlantic Coast States by CASTLE & OVERTON, Inc., 630 Fifth Avenue, New York City.
CASTINGS
THE APPLETON MACHINE COMPANY
APPLETON · WISCONSIN

FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending December 11, 1943

STOCKS

	High	Low	Last
A. P. W.	2⅛	2	2
Armstrong Cork Co.	37⅝	36⅛	36¾
Celotex Corp.	11⅞	11	11¾
Celotex Corp., pf.	17½	17¼	17¾
Certain-Teed Products Corp.	5⅜	5	5⅛
Certain-Teed Products Corp., pf.	62¾	57¾	61¾
Champion Paper & Fibre Co.	20	18½	19½
Champion Paper & Fibre Co., pf.	108½	108	108
Congoleum Nairn Co.	23	22	22¾
Container Corp. of America	20⅛	19⅜	20⅛
Continental-Diamond Fibre Co.	11½	11⅛	11⅜
Crown-Zellerbach Co.	15⅜	15	15⅜
Crown-Zellerbach Co., pf.	95⅝	95¼	95½
Dixie Cup Co.	14½	14	14½
Dixie Cup Co.—A	43	42½	42¾
Flintkote Co.	19¾	19	19
Flintkote Co., pfd.	107	107	107
Robert Gair	3⅜	3	3
Robert Gair, pf.	13	13	13
International Paper Co.	14	13	13⅞
International Paper Co., pf.	66⅛	64¼	66¼
Johns-Manville Corp.	88½	86	88
Johns-Manville Corp., pf.	126¾	126¾	126¾
Kimberly-Clark Corp.	....	....	....
MacAndrews & Forbes	24¾	24⅛	24¾
MacAndrews & Forbes, pf.	138	138	138
Masonite Corp.	38⅛	37	37¾
Mead Corp.	8½	7⅝	8¼
Mead Corp., pf. A—6%	83	83	83
Mead Corp., pf. B—5½%	68½	65	65
National Container Corp.	12½	11⅛	11⅞
Paraffine Companies, Inc.	44¾	44¾	44¾
Paraffine Companies, Inc., pf.	....	....	....
Rayonier, Inc.	13⅜	12¾	12⅞
Rayonier, Inc., pf.	29⅞	29⅛	29½
Ruberoid Co.	25⅝	24⅛	25⅛
Scott Paper Co.	37	36½	37
Scott Paper Co., pf.	108½	108	108
Sutherland Paper Co.	30¾	30⅛	30¾
Union Bag & Paper Corp.	10	9⅞	10
United Paperboard Co.	4¼	4⅛	4¼
U. S. Gypsum Co.	70¾	70	70
U. S. Gypsum Co., pf.	172½	172½	172½
West Virginia Pulp & Paper Co.	16½	15¼	16
West Virginia Pulp & Paper Co., pf.	106	105	106

BONDS

Abitibi Pulp & Paper Co., 5s '53	....	....	....
Celotex Corp. 3¾s '55	101⅛	101⅛	101⅛
Certain-Teed Products Corp. 5½s '48	100½	100	100
Champion Paper & Fibre Co. 4¾s '50	....	....	....
International Paper Co. 6s '55	107	106½	106½
International Paper Co. 5s '47	104½	104½	104½
Mead Corp. 3½s '53	....	....	....
West Virginia Pulp & Paper Co. 3s '54	103⅜	103¼	103¼

New York Curb Exchange

High, Low and Last for Week Ending December 11, 1943

STOCKS

	High	Low	Last
American Box Board Co.	6¾	6¼	6⅜
Brown Co., pf.	....	....	....
Great Northern Paper Co.	30	29	29¼
Hummel-Ross Fibre Corp.	4¼	4	4⅛
St. Regis Paper Co.	4	3¼	3⅞
St. Regis Paper Co., pf.	138	137	138
Taggart Corp.	5⅛	4⅝	5

BONDS

American Writing Paper Co. 6s '61	98½	98	98¼

Abitibi Profits Show Increase

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., December 13, 1943.—Abitibi Power and Paper Company profits have shown a substantial increase during the current year to date, as compared with the corresponding period of 1942, after payment of all operating expenses, but before provision for depreciation, interest or income and excess profits taxes, according to Financial Counsel.

While Abitibi has suffered, along with the rest of the newsprint industry, from the pro-ration of newsprint down to a basis of approximately 66% of capacity, as compared with the industry's average of 72% in 1942, and costs have also increased throughout the industry, it is believed that more than average benefit has been derived by Abitibi from the sales of sulphite pulp. There has been an exceptionally strong demand for sulphite and Abitibi is understood to have been well placed to take advantage of this situation by reason of a substantial pulpwood inventory which it carried into 1943.

The service says: "High level of earnings this year has resulted in a further large accumulation of surplus working capital, indicating ability to make another sizeable capital distribution to shareholders when and if this fits in with reorganization plans. It can be estimated that net working capital at the end of the first ten months of this year amounted to $24,000,000 or more, subject to year end reserve appropriations for taxes or other purposes. At the end of 1942, net working capital had reached a record total in excess of $24,700,000 and this was increased by approximately $1,000,000 early in the present year through money received from sale of the Espanola assets. In June, 1943, there was paid to bondholders over $89,200,000 leaving about $16,500,000 of net working capital to which would be added accumulations resulting from this year's earnings.

West Virginia Calls Finance Meeting

Thomas Luke, president of the West Virginia Pulp and Paper Company, has announced that at a meeting to be held on January 7, 1944, the common stockholders will be asked to authorized $20,000,000 of new preferred stock.

The company proposes, under suitable market conditions, to issue $15,583,000 of the new preferred for retirement by exchange or redemption of the present 6% preferred stock now outstanding in such amount. It is contemplated that the new preferred will have a dividend rate not in excess of 4½%. Upon determination to issue the new preferred stock, it is the present intention of the company to retire, out of treasury cash, the outstanding funded debt consisting of about $4,600,000 of 3% bonds.

The program also provides for increasing the authorized common stock from 1,000,000 shares to 1,500,000 shares. There are presently outstanding with the public 902,432 shares of common stock.

A proxy statement has been filed with the Securities and Exchange Commission and is expected to be mailed to stockholders on December 15. It is stated that the company has no present intention of issuing any common stock and does not propose to issue any of the new preferred stock except for the proposed retirement of the present 6% preferred stock.

If the program is carried out, it is expected that Harriman Ripley & Co., Inc., will head a group to underwrite the $15,583,000 of new preferred stock.

Price to Redeem Bonds

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 15, 1943.—Price Brothers and Company, Ltd., one of the largest firms of newsprint manufacturers in Quebec, has announced that it will redeem all debts convertible 4% debentures on March 1, 1944, at par.

The amount of debentures outstanding was shown at $3,936,800 in the last-issued annual report as at December 31, 1942. However, the company showed

among its assets that it held $1,121,300 par value of its debentures, so that the net amount apparently outstanding in the public hands was $2,815,500.

The company has been able to reduce its funded debt steadily during the past few years. This has been done principally through the maturity each year of fixed portions of a series issue of first mortgage bonds. After the forthcoming redemption, the funded debt will consist of $12,000,000 of first mortgage 5's maturing in 1957, indicating a reduction of nearly $7,000,000 since March 31, 1938, when first mortgage bonds were outstanding to a total of $15,000,000 and the convertible 4's to an amount of $3,936,800.

The company's net working capital has increased from $7,207,166 on March 31, 1937, to $15,627,773 on December 31, 1942.

Donald Walker Gets Commission

Donald Walker, son of Elwin Walker, Treasurer of Walker Goulard Plehn Company, Inc., 450 Pearl street, New York, enlisted in the regular Army three months before Pearl Harbor. He was transferred to Panama, where he worked his way up to Staff

LIEUT. DONALD WALKER

Sergeant. He passed the examinations permitting him to come back to the States to take officers training, and has just completed his course at the NOSA, Hallorand Field, New Orleans, and is now a Second Lieutenant in the Transportation Corps. The Walker Goulard Plehn Company has 27 young men fighting with Uncle Sam's forces, which is more than two-thirds of its male personnel.

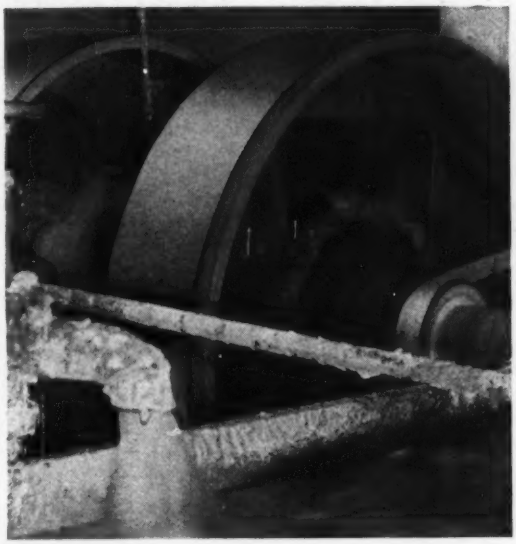
A. J. Pagel Heads Pulp Importers

At the annual meeting of the association of American Wood Pulp Importers held December 9 at the Stockholm Restaurant, the following officers were elected for the coming year:

President, A. J. Pagle; vice president, Rolf Westad; treasurer, B. Lindell; secretary, A. Blattmann.

These four officers, together with the retiring president, Pehr G. A. Sparre, will comprise the associations' board of directors.

HIGH HUMIDITY
doesn't always bring
LOW BELT EFFICIENCY



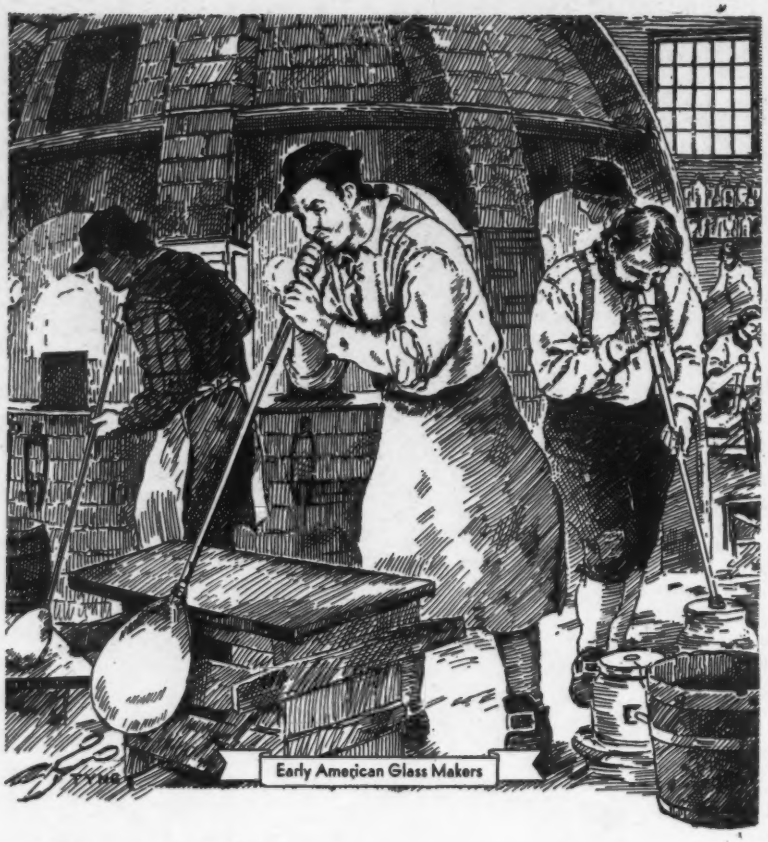
TANNATE WATERSHED
carries nearly full load
. . . even when damp!

That's why Tannate is the preferred belt in so many paper and pulp mills. It is made with waterproof cement and treated for moisture resistance, so that even where adverse atmospheric conditions exist . . . high operating efficiencies are maintained.

Great strength, firm pulley grip, resistance to stretch, to the effects of machine oils and many weak chemicals are other reasons for Tannate's wide usage in the paper industry. Reports from mills using Tannate show both operating efficiency and economy. A copy of our bulletin which includes several of these reports will be sent you on request.

STEP UP PRODUCTION with
RHOADS Tannate WATERSHED LEATHER BELTING

—Established 1702—
J. E. RHOADS & SONS
35 N. SIXTH ST., PHILADELPHIA 6, PA.
NEW YORK • CHICAGO • ATLANTA • CLEVELAND



Glass Making was among the earliest American Industries. It is reported that in 1639, glass works in Salem, Mass., covered many acres. Sandwich, Mass., on Cape Cod is still famous for its glass, although the industry there has long since ceased. Among the most interesting uses for glass was the making of beads gaily colored, for trading with the native Indians.

The illustration shows the early type of circular furnace, around which the glass-blowers blew and shaped their product.

We do not have to "blow" about our product! But we wish to remind you that the finest craftsmanship of New England is still reflected in **DRAPER FELTS.**

Draper Felts Favor Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASS.

OUR REPRESENTATIVES *to serve you*

L. H. BREYFOGLE, Kalamazoo, Mich.

W. L. CAMPBELL, Savannah, Ga.

RALPH E. BRIGGS, Canton, Mass.

E. R. LELOFF, Vancouver, Wash.

Forest Mission to Chile

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 15, 1943—Five Forest Service specialists are on their way to Chile to aid that country in a study of its forest resources and possibilities for expansion of its wood utilization industry, the Department of Agriculture said today.

The project will be carried out under an agreement between the Forest Service and the Corporacion de Fomento de la Producion, an agency of the Chilean government, which will finance the project. The work will include field surveys to determine the extent and character of the forests of Chile, studies of logging methods and costs, and of timber species of potential commercial value.

Dr. I. T. Haig, chief of the Division of Forest Management Research, will have general charge of the project. Others in the mission are Philip Briegleb of the Pacific Northwest Forest Experiment Station, Burnett Payne of the North Pacific Region, Lawrence V. Teesdale of the Forest Products Laboratory, and Dr. M. L. Haertel, consulting technician on the wood chemical distillation industry.

It may be desirable to make additional tests of Chilean timber species, including their pulping qualities, at the Forest Products Laboratory in Madison, Wisconsin.

Chile's forest resources are of great importance in the internal economy of the country, and ways will be sought to develop new wood utilization industries as well as improve forest conditions. There are a considerable number of sawmills, mostly of small capacity, and several paper and plywood mills, and possibilities for expansion are believed to be promising.

Selection of Packing

A helpful guide for the selection of packing is contained in a bulletin published by Greene, Tweed & Co. This bulletin tabulates in alphabetical arrangement more than three dozen different fluids handled in process work and general plant services and lists the correct Greene, Tweed packing for each liquid, gas and vapor. An additional tabulation describes the form and construction of each Greene, Tweed packing and lists typical kinds of equipment for which each one is suited. Tables of sizes and weights are also included. Copies of this informative guide can be obtained by addressing Greene, Tweed & Co., Bronx Boulevard at 238th Street, New York 66, N. Y.

Printers to Save Paper

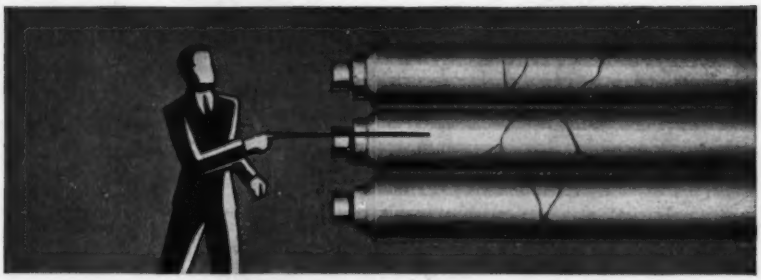
Savings in paper of at least 25% are predicted by commercial printers, if the War Production Board adopts five suggestions made public last week by the Joint Committee on Government Relations of the Commercial Printing Industry.

The recommendations cover simplification and standardization of printing papers; the use of lighter weight stock; the elimination of bleed pages, French folds, overhanging covers, covers on small booklets, blank pages, and similar practices which are uneconomical in use of paper; a change in present regulations that result in an inequitable distribution of paper; and permission for printers to use paper now on hand, whatever its weight.

Active support of buyers of commercial printing is being sought for the program, particularly the support of such groups as the Association of National Advertisers, the National Association of Manufacturers, the American Association of Advertising Agencies, and others.

"Paper tonnage must be saved," James F. Newcomb and Edwin Lennox, co-chairmen of the Joint Committee said. "If a business form, now printed on one side of the paper, can be printed on both sides, the saving in paper is 50%. If a job that now uses 60-lb. stock can be printed on 45-lb., a saving of 25% takes place. Similar savings often can be effected by eliminating blank pages, by reducing space between lines, by using a legible but more condensed kind of type. It is only through the cooperation of everyone concerned that we can stretch available supplies of paper without imposing a hardship on business."

The Joint Committee represents the commercial printing industry of New York, Chicago, Albany, Dallas, Detroit, Minneapolis, St. Louis, and other cities where most of the commercial printing of the country is done. Executives of the Joint Committee have been working closely with Government officials in Washington. They plan an intensive and extensive educational campaign among commercial printers and users of commercial printing to win the voluntary cooperation of all. Members of the Joint Committee feel that cooperation, rather than Governmental restriction, will furnish the best solution for the problem of conserving paper without substantially impairing the services of printers to business, industry and the general public.



WHY *should a marked roll be removed from a calender at once?*

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For a more detailed discussion of this subject see page 8 of the new 32-page booklet, "A PRACTICAL GUIDE TO THE CARE OF CALENDERS AND CALENDER ROLLS," from which the above paragraph is quoted. This booklet will help you to avoid calender failure. It lists the causes of roll trouble and gives many helpful hints on grinding procedure. Discusses proper lubrication of both calender stacks and roll grinders. *Information applies to any make of calender.* Contains no advertising.

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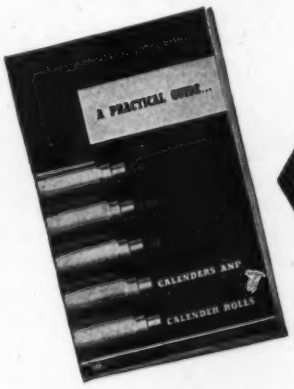

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"Can-Within-A-Can"

The usual difficulties experienced in packaging a resinous emulsion base paint in a fiber container are said to be removed through a new development of The Sherwin-Williams Company, world's largest paint manufacturers. A paper-thin, metallic liner in the paper paint cans now being used by the company, forms a "can-within-a-can" and effectively seals in the contents and prevents moisture from penetrating the can walls.

The problem of how to construct a strong, durable container was met through the use of rigid paper tubes, and a special treatment of the container's inner walls to seal in the contents and keep outside moisture from penetrating the tubing. The present liner forms a leak-proof seal and is highly satisfactory for Kem-Tone, the resinous emulsion base paint intended for home and factory maintenance work. Visual inspection of the finished can shows a smooth inner surface. It is said that after labelling, the layman cannot distinguish the paper can from the metal can it replaces.

PAPER
TRADE JOURNAL
Title Reg. U. S. Pat. Off.
Henry J. Berger
EDITOR

Vol. 117 December 16, 1943 No. 25

COMING EVENTS IN PAPER INDUSTRY

American Paper and Pulp Association, Sixty-seventh Annual Convention and meeting, Waldorf-Astoria Hotel, New York, February 14-18.
Technical Association of the Pulp and Paper Industry, Convention, Commodore Hotel, New York, February 14-17.
National Paper Trade Association of the United States, Convention, Waldorf-Astoria Hotel, New York, February 14-17.
The New York Association Of Dealers In Paper Mills' Supplies, Annual Banquet, Commodore Hotel, New York, Tuesday, February 15.
New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.
Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.
Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.
Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

POST-WAR INFLATION

As economic factors create similar effects and result in either periods of prosperity or depression, with relatively high and low prices, the several aspects of post-war inflation are now being more and more freely discussed as the day of victory appears nearer. The highest price level was not reached during World War 1 but in the post-war year of 1920. The practically controlled economy now in effect is not considered to provide sufficient control to keep prices to the arbitrary levels selected. A higher price level or a greater degree of inflation is currently viewed as a profitable aftermath of the global war of today. The index of the price of foodstuffs, to select a single example, as compiled by the Bureau of Statistics, was 119.1 in 1918, and rose to a high of 150.7 in 1920. The index today is 205.4, while the index of such foods as are controlled by the OPA (including lard, sugar and coffee) was 163.0 on December 10, 1943. The current figures are based on the August, 1939 level and because of changes made in 1936 in computing the index, are not strictly comparable with preceding years. They may be useful, however, in providing a general informative background of the inflationary levels during the last war and the present conflict.

In discussing the problem of inflation in the November 16 issue of "Consumer Credit," published by the Consumer Banking Institute, Washington, D. C., the leading article states: "The problem of post-war inflation is primarily a consumer problem. Upon its solution depends the complete development of the distribution artery of our economic life to a point where it can perform as efficiently as can our productive artery. The crux of this problem and its solution is the large amount of war savings now being held in liquid form (cash, deposits and Government Bonds) by individuals. Whether these savings become consumer capital or just so much 'water' depends upon the manner in which they are used . . . The Department of Commerce has estimated that individuals will save $36 billion this year. These large savings will represent about 25% of total income payments to individuals. They will bring the aggregate amount saved in four years to the huge sum of $84 billion, or more than the total income of individuals during any single year before 1941." (The savings of individuals, including unincorporated business, totaled $7.5 billion in 1940; $13.6 billion in 1941; $26.9 billion in 1942 and an estimated $36 billion in 1943.)

In analyzing the result of the post-war inflation threat the article goes on to say that, "to demonstrate these possibilities, assume that manufacturers are still producing at the 1943 rate when the war ends. This would mean that 64% of total capacity would be in war production. Almost one-half or 49% of all output would be durable war goods and largely unsuited for civilian uses. Probably one-half of all facilities would have to be reconverted to peacetime production. During the reconversion period, therefore, total manufacturing output would be about one-half of what is is now. This means that total production income paid to individuals by manufacturers would also be temporarily cut in one-half. If all consumers together try to buy larger amounts of manufactured goods before this reconversion is completed, they will only bid up prices and spend their savings for nothing. They could very easily spend all of their current income and their $84 billion savings for goods which could otherwise be bought from current income alone."

The analysis continues: "It has been suggested that the government can relieve some of this pressure by selling its surplus war goods in post-war markets. In the face of an exaggerated buying spree, however, it is doubtful that sufficient goods would be available from this source to prevent a severe inflation. If inflation does get out of hand, complete conversion may never be accomplished. Total production levels might simply adjust themselves to the new and lower level of income payments. The large potential productive force which the war has shown to be ours might never be realized in peace time. But by holding their savings until goods are made available, individuals will exert a potent force toward a speedy and complete reconversion of all productive facilities. At the same time, by thus causing production to be at a continuing high level, they can insure that income will also continue to be high. As a result, actual consumer expenditures can be financed from current income and the backlog of savings can be kept intact to maintain the new level of production and income. In this way these savings truly become consumer capital."

In its conclusion the article points out that, "If post-war business and production can be maintained

at the 1943 level, all individuals together will receive an annual income of about $142 billion or 85% more than in 1940. Even if taxes also remain at the 1943 level, individuals would still have left an aggregate spendable income of $126 billion or 74% more than in 1940. Under these circumstances the tax burden upon individuals would amount to about 11% of their gross income. But if post-war activity falls back to the 1940 level, all individuals together would receive an annual income of only about $76 billion, including government payments. While prices would decline, it would still be necessary to levy large taxes to service the public debt. If the amount of taxes remained at the 1943 level, they would constitute a first claim against 21% of all income received by individuals. Spendable income after taxes would then be around $60 billion, or about what it was in 1935."

Release Printing Papers

WASHINGTON, D. C., December 15, 1943.—Inventories of 12 different weights of printing papers, now in the hands of printers and dealers, may be used until March 15, 1944, the War Production Board Printing and Publishing Division said today. The release of this inventory paper for 90 days, beginning December 15, was effected through an amendment to WPB Commerical Printing Order (L-241).

The amendment provides that, although certain weights of paper may not be employed for specified uses, any paper, regardless of weight, which was manufactured prior to October 21, 1943, may be consumed, provided the printing is completed by March 15, 1944.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1943		Corresponding Weeks—1942	
October 30	89.5	October 31	92.9
November 6	90.6	November 7	88.5
November 13	89.4	November 14	89.7
November 20	91.0	November 21	86.9
November 27	89.8	November 28	82.3
December 4	91.7	December 5	84.9

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1942	104.5	103.9	102.9	100.4	95.3	87.4	75.8
1943	87.2	88.9	89.5	88.7	91.4	86.4	84.4

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1942	80.8	82.8	90.6	86.9	80.1	90.4
1943	91.1	88.3	90.2	90.6	....	....

COMPARATIVE YEARLY SUMMARIES

	1936	1937	1938	1939	1940	1941	1942	1943
Year to Date	80.0	82.1	71.4	82.8	86.0	97.2	91.4	88.8
Year Average	80.4	79.8	71.5	83.4	85.6	97.4	90.4	....

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIO †

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Ave.
1937	83	89	89	91	88	80	69	77	72	70	57	47	75
1938	56	63	63	60	60	59	59	60	70	73	67	61	64
1939	65	73	76	74	69	73	68	77	82	91	88	77	77
1940	78	75	74	76	82	85	77	79	78	85	82	77	78
1941	81	88	89	89	91	94	92	98	95	99	98	90	92
1942	102	101	101	95	82	72	68	75	76	81	82	77	84
1943	86	88	94	94	96	94	89	96	94	94	93	..	..

Week ending Oct. 30, 1943—94
Week ending Nov. 6, 1943—93
Week ending Nov. 13, 1943—95
Week ending Nov. 20, 1943—94
Week ending Nov. 27, 1943—91
Week ending Dec. 4, 1943—95

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.

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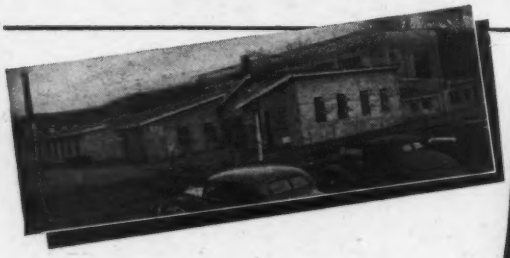

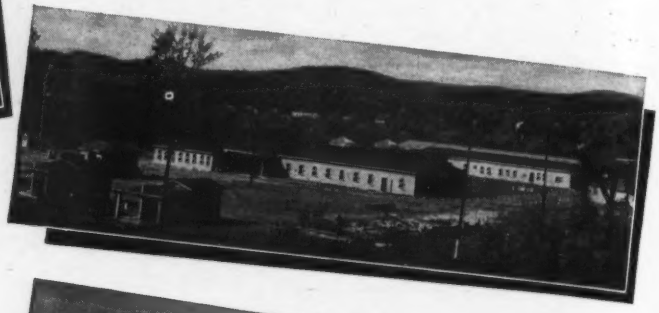

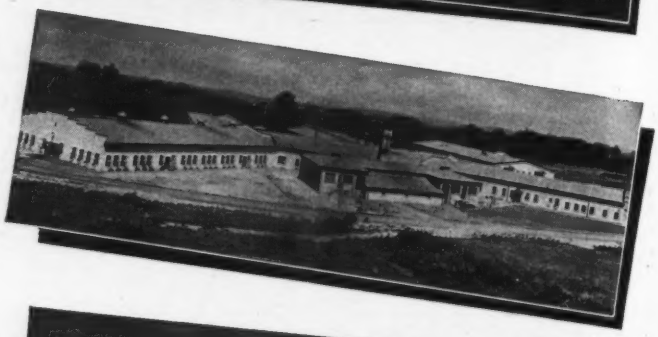

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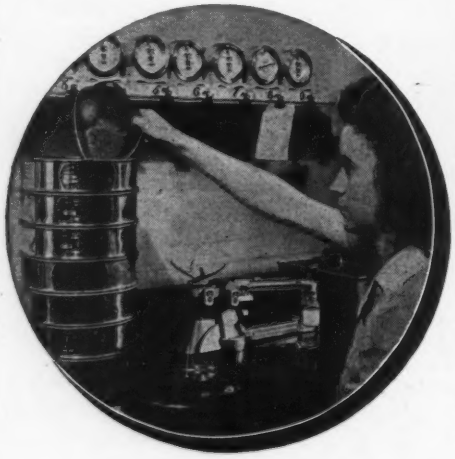

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Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Printing-Ink Permeation of Paper

(Castor-Oil Test)

Revision of TAPPI Tentative Standard T 462 m-43

This method consists of measuring the time in which a drop of U.S.P. castor oil produces a uniform translucent spot in paper. It is a measure of the receptivity of paper to printing inks having an oil vehicle, but is suitable only for easily permeable papers such as news, book, and mimeograph.

Apparatus

1. *Box* having an open front; a ground-glass top containing a ¾-inch hole for observation of the specimen; a ground-glass partition parallel with the front side to prevent excess heat from affecting the test results; a 15-watt electric bulb placed back of the partition for illumination of the sample; and an adjustable mirror near the bottom of the box and centered on the hole in the top of the box for observation of the specimen.

2. *Separatory funnel* with a tip approximately ¾ inch in length and of such diameter that 25 drops of distilled water delivered at 21°C. (70°F.) will have a volume of 1 ml. The funnel is suspended with the end of the tip approximately 1¾ inches above the test specimen and contains U.S.P. castor oil, the temperature of which is maintained during the test at 25 ± 2° C. (77 ± 3.5° F.)

Test Specimen

The test specimens shall be so selected from the sample secured by TAPPI Standard T 400 m as to be representative of the sample. Specimens 2 inches square are suitable. They shall be conditioned for testing according to TAPPI Standard T 402 m.

Procedure

The test shall be made in the atmospheric conditions specified in TAPPI Standard T 402 m.

Place the specimen over the hole in the top of the box. Let a drop of the U.S.P. castor oil fall from the funnel upon the specimen and start a stopwatch the instant the drop strikes the specimen. Observe the under side of the specimen and measure the time interval from the instant of contact of the oil with the paper until the spot of oil reaches a uniform and maximum translucency. Covering the spot of oil with a cap having a black interior aids in the determination of the end point.

Report

The report shall give the maximum, minimum, and average time of penetration, to the nearest 5 seconds, for not less than 5 tests on each side of the paper.

References

Reed, E. O., "Resistance of Printing Papers," *Paper Trade J.* 86, No. 12:54 (March 22, 1928); *Tech. Assoc. Papers* 11, No. 1:144-145, 239-240 (June, 1928).

Wehmhoff, B. L., "Evaluation of the Printing Quality of Paper," *Paper Trade J.* 100, No. 6:41 (Feb. 7, 1935); *Tech. Assoc. Papers* 18:55, 337-340 (June, 1935).

Discuss Waste Paper Collections

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., December 13, 1943.—Collecting waste paper and sending it to the mills will be discussed at a meeting Tuesday at Hotel Bancroft, Worcester, Mass., of War Production Board salvage officials and representatives of eight Massachusetts mills which require nearly 15,000 tons of waste paper weekly to operate at capacity.

Firms represented will be Newton Paper Company, Bird & Son, Robert Gair Company, Fitchburg Paper Company, Chemical Paper Company, Natick Paper Box Company, American Writing Paper Company and Columbian Boxboard Mills.

In Boston, George G. Hyland, director of the city salvage committee, appealed to school children to appoint themselves custodians of waste paper in their homes and to prepare it for the collection during the coming week.

Frank Townsend, Cambridge, Mass., salvage chairman, has announced a city-wide collection of waste paper in that city January 9.

Change in T 454 m-42

TAPPI tentative standard T 454 m-42, Turpentine Test for Grease Resistance of Paper, specifies the use of Cumberland Gloss No. 2 coated 80-pound book paper, 25x38-500 basis, for use in making the test. Since government emergency restrictions prevent the manufacture of this paper in weights heavier thas 70-pound paper, the use of the latter has been authorized by the Paper Testing Committee with the approval of the chairman of the technical committee of the Glassine and Greaseproof Manufacturers Association.

The S. D. Warren Company has requested that orders for this paper be sent to its sales department, 89 Broad street, Boston, Mass., rather than to Cumberland Mills, Maine.

Agricultural Residue Pulps—Bleaching Studies on Straw Pulps*

By S. I. Aronovsky,[1] G. H. Nelson,[2] and E. C. Lathrop[3]

Abstract

1. The present status of the industrial utilization of agricultural residue fibers is discussed briefly.

2. Wheat, oat, rice, barley, and rye straws, flax shives and soybean stalks were analyzed and cooked with sodium hydroxide to yield pulps of varying lignin content, which then were bleached by the single-stage and three-stage processes.

3. The lignin contents, permanganate numbers, and Roe chlorine numbers were determined for the various pulps, and the interrelationships between these characteristics and bleach consumption at a brightness (Hunter reflectometer) of 70% were studied.

4. The data obtained show, in general, that these agricultural residues classify themselves into two groups, with the cereal straws in one group and the flax shives and soybean stalks in the other.

5. Straight-line relationships were obtained for lignin with permanganate number and with Roe chlorine number, and, from these in turn, between permanganate and Roe numbers. Direct relationships were also found for bleach consumption with lignin, with permanganate number, and with Roe chlorine number.

6. Rice straw pulp consumes less chlorine than the other pulps bleached to the same brightness, possibly due to the high silicious ash content of this pulp.

7. Economy in chlorine results when three-stage instead of single-stage bleaching is used, but this is partly offset by the higher loss in pulp substance with the three-stage process.

8. To avoid excessive degradation of alpha-cellulose, single-stage bleaching may be used to obtain pulps with brightness up to 70%, but three-stage bleaching should be used beyond that point.

Economic rather than technological factors have been mainly responsible for the fact that fibrous agricultural residues, such as cereal straws, sugar cane bagasse, cornstalks, etc., have found only very limited use in the commercial manufacture of pulp and paper.

Only in recent years have agricultural residues been used on a large commercial scale as a source for paper pulps in countries poor in forest resources. The Pomilio process has been operated for several years in Italy *(10)*, and more recently, plants using this process for making a wide variety of papers have been built and are operating in South Africa *(11)*, in Chile *(12)*, and in Argentina *(13)*. A pilot plant was using this process in 1941 in the Philippines *(15)*. The Japanese are said to use bagasse for paper manufacture in Formosa *(8)*, and the Dutch in Java were using rice straw *(14)*.

In Europe today, with the exception of the Scandinavian countries, agricultural residues serve to quite an extent to supplement wood as a source for paper and for dissolving pulps. England, particularly, has given considerable attention to the conversion of mills to use cereal straw; partly in an effort to replace esparto and wood pulp, and partly to produce a variety of needed papers *(9)*.

No one can foresee how much further such economic changes may go either during the war or afterwards. It appears that this country is not likely to face any such situation in cellulose supply in the near future as do the European countries and most other world nations, but many shortages have been found unexpectedly in prosecution of the war.

It is certain that the whole world is in a period of rapid and extensive economic change, and that to realize a world peace many of our present ideas and customs require modification. Any lasting basis for peace must take into account a much sounder economic structure for the farmer since food and fiber are necessities of life. Such an agricultural economy will require the utmost dollar return to the farmer for the fruits of his soil and labor. Agricultural residues represent more than one half the annual growth on cultivated lands the world over. While a goodly share of such residues should be returned to the soil, there are many reasons why millions of tons of these wastes, which bring no money value to agriculture, should find industrial utilization. This is a world-wide problem; much effort has been expended on it with but meager results.

In the United States it is estimated that one hundred million tons of such residues are annually available for use by industry *(2, 18)*, but only a little more than 1.25 million tons find use today. Of this amount, three industrial uses account for approximately 1 million tons—e.g., wheat and rye straw for manufacture of corrugating box board, seed flax straw for the manufacture of cigarette paper, and sugarcane bagasse and cornstalks for the manufacture of insulating building material. The products so manufactured are outstanding in their respective fields.

The problem of developing commercial uses for agricultural residues in the United States and possessions was assigned to the Northern Regional Research Laboratory, one of the four such regional laboratories established by Congress and put into operation by the United States Department of Agriculture early in 1941. This problem is being attacked on four fronts: (a) Improvement in the economic factors of collection, transportation, and preservation of these residues, including surveys relating to production, location, and accessibility to industry *(3, 7)*; (b) methods of utilizing the cellulosic constituents of the residues;

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* Presented (by title) at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 15-18, 1943.

[1] Member TAPPI; Head, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory, Peoria, Ill.

[2] Associate Chemist, Pulp and Paper Section, Agricultural Residues Division, Northern Regional Research Laboratory, Peoria, Ill.

[3] Member TAPPI; Chief, Agricultural Residues Division, Northern Regional Research Laboratory, Peoria, Ill.

The Northern Regional Research Laboratory is one of four regional laboratories authorized by Congress in the Agricultural Adjustment Act of 1938 for the purpose of conducting research to develop new uses and outlets for agricultural commodities. These laboratories are operated by the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

(c) methods of using the hemicellulose fractions; and (d) methods of using lignin and lignin residues.

Two guiding principles are recognized—first, every process considered must, if possible, secure some money return from each major constituent, e.g., cellulose, hemicellulose, and lignin; and, second, the main product of a commercial process must fill the use requirement better than competitive products.

More study has been given to the use of the cellulosic constituents of agricultural residues than to that of the other components. The patent and technical literature abound with processes and experiments on cellulose production from such sources. Most of these are fragmentary and, in general, the effort has been to develop a paper or dissolving pulp as a substitute for a product prepared from wood. On the other hand, the outstanding commercial products made from the residues mentioned above have for many years been able to compete satisfactorily with substitutes made from wood. Success, therefore, logically falls to the raw material which can produce a superior product. It has long been known that cellulose fibers resulting from the pulping of straws, stalks, bagasse, etc., possessed properties differing from those of wood fibers, and these differences have for the most part been considered detrimental for pulp and paper.

No exhaustive study of the properties of cellulosic fibers from agricultural residues has been made to the end of finding in what respects such fibers may be superior to wood fibers. As a result of extensive developments in the field of paper specialties and of the slowly accepted technique by the paper mill operator of the blending of fibers to produce such special products, a wide field is open for fibers with special properties.

An exhaustive study of agricultural residue fibers as related to industrial uses is under way at this Laboratory.

The first work in this program arose with the war emergency. It was anticipated that pulps made from cereal straws might produce needed properties not completely supplied by pulps made from wood. This goal was realized.

In preparing purified pulps from cereal straws for these special purposes, it was found that a drastic loss in yield occurred in the bleaching and alkaline refining steps. The bleachabilities of these pulps, to the desired brightness determined by the usual jar method, showed that the procedures used for wood pulps could not be applied directly to the cereal straw pulps without some modification. This is also indicated by other recent work *(16, 17)*. A program was initiated to obtain the correlations between bleaching and some of the methods for determining the bleachability of agricultural residue pulps.

Preparation and Analyses of Raw Materials

The materials used in this study were: wheat, oat, rice, barley, and rye straws, flax shives, and soybean stalks. Pulps from some of these straws were on hand from previous work, and the remainder were obtained by cooking with various amounts of caustic soda to yield products with different lignin contents.

The various straws and other raw materials were shredded in an ensilage cutter or in a hammer-mill type shredder and then screened to remove dust and fines. With wheat and rice straws the screening and removal of hulls, weeds, and seeds were carried out by hand on a stationary 4-mesh screen, while a mechanical vibrating screen (4-mesh) was used for the others. The major portion of the cut or shredded cereal straws used for cooking varied from ½ inch to about 3 inches in length. All of the flax shives retained on a 40-mesh screen, and the soybean stalks remaining on a 10-mesh screen, were saved for the experiments. The description of the raw materials and the screening data are given in Table I. Variations in yields of screened materials are due partly to the type of material itself, and partly to the nonuniformity of the methods of shredding and screening used.

The screened raw materials, ground in a Wiley-type mill to pass a 3-mm. screen, were analyzed for

TABLE I.—RAW MATERIALS, SCREENING, AND PREPARATION
(All data based on original air-dry raw material)

Material	Source and Condition	Treatment	Original Weight, lb.	Retained on Screen, %	Through Screen, %	Dust and Fines Recovered, %	Loss, %
Rice straw	Crop year 1941, Louisiana; dry and bright; considerable adhered dirt; quite leafy and free from weeds.	Shredded in ensilage cutter; hulls and weeds removed by hand; screened on ¼" stationary screen.	130	82.1	16.2	..	1.7
Barley straw (Ezond)	Crop year 1942, Nebraska; dry and bright; free from weeds; high chaff content, quite leafy; baled from stack.	Shredded in hammer mill; screened on ¼" vibrating screen.	773	74.3	25.9	0.3	+0.5*
Wheat straw (Russian)	Crop year 1941, Illinois; dry, slightly weathered; quite free from weeds; considerable chaff and leaves.	Shredded in ensilage cutter; hulls and weeds removed by hand; screened on ¼" stationary screen.	57	60.2	33.9	..	5.9
Rye straw	Crop year 1939, Iowa; dry, slightly weathered; quite free from weeds; considerable chaff and leaves; baled from stack.	Shredded in hammer mill; screened on ¼" vibrating screen.	99	59.3	37.9	1.0	1.8
Oat straw	Crop year 1939, Iowa; dry, bright; quite free from weeds; considerable chaff and leaves; baled from stack.	Shredded in hammer mill; screened on ¼" vibrating screen.	109	63.1	35.6	0.9	0.4
Flax shives	Crop year 1941, Minnesota; dry, slightly weathered; 6.6% fines and dirt, 5.4% tow.	Shredded in hammer mill; screened on 40-mesh vibrating screen.	89	89.6	7.9	1.7	0.8
Soybean stalks (Chief)	Crop year 1942, Illinois; dry, slightly weathered; 5.2% leaf blades and petioles, 10% pods, 5.4% beans, 2.9% weeds; baled from windrow immediately after combining.	Shredded in hammer mill; screened on 10-mesh vibrating screen.	125	61.2	37.0	1.8	0.6

* Plus value probably due to increase in moisture content during shredding and screening operations.

the following: ash, cold water extractives, hot water extractives, 1% NaOH extractives, benzene-alcohol extractives, lignin, pentosans, Cross and Bevan (C&B) cellulose, pentosans in C&B cellulose, chlorine consumption in C&B cellulose determination, alpha-cellulose, and nitrogen. The official TAPPI methods and those recommended for wood by the Forest Products Laboratory *(1)* were used whenever possible, but some of the methods required modification for use with these agricultural residue materials. The data are given in Table II.

TABLE II.—RAW MATERIALS—PROXIMATE ANALYSIS
(All values except moisture are on basis of moisture-free material)

Constituent	Material						
	Rice Straw	Barley Straw	Wheat Straw	Rye Straw	Oat Straw	Flax Shives	Soy-bean Stalks
Moisture, %	8.0	8.4	6.6	7.4	7.0	8.1	8.3
Ash, %	16.1	6.4	6.6	4.3	7.2	3.5	2.3
Extractives							
Alcohol-benzene, %	4.6	4.7	3.7	3.2	4.4	4.1	3.9
Cold water, %	10.6	16.0	5.8	8.4	13.2	9.7	7.3
Hot water, %	13.3	16.1	7.4	9.4	15.3	11.4	8.8
1% NaOH, %	49.1	47.0	41.0	37.4	41.8	32.0	32.0
Nitrogen, %	0.58	1.10	0.38	0.72	0.46	0.69	0.66
Lignin, %	11.9	14.5	16.7	19.0	17.5	22.3	19.8
Pentosans, %	24.5	24.7	28.2	30.5	27.1	23.6	24.8
Cross and Bevan Cellulose							
Crude, %	49.8	48.2	54.4	54.9	53.6	48.4	50.1
Ash free, %	48.6	47.4	53.6	54.3	53.4	46.2	48.2
Chlorine consumption, %	14.8	15.6	13.9	14.6	14.4	12.4	10.3
Pentosans, %	27.8	30.0	26.8	29.5	28.4	21.6	22.1
Alpha-Cellulose							
In Cross and Bevan cellulose, %	72.7	70.1	73.3	68.5	73.4	72.1	68.7
Basis o.d. straw, %	36.2	33.8	39.9	37.6	39.4	34.9	34.5

Preparation and Analyses of Pulps

A. Cooking

The digestion equipment consisted of steam-jacketed cylindrical, 12-gallon, stainless steel autoclaves, equipped with transmission for tumbling. The bottoms of the autoclaves are conical and are fitted with quick-opening gate valves for "blowing" the digester charge.

Approximately 10 pounds of the air-dry screened straw or stalks were placed in the autoclave and enough alkaline liquor was added to make the ratio of total water to moisture-free material, 8:1. The amount of caustic soda was varied from 9 to 24% on the basis of the moisture-free material. The period of cooking was 2 hours at approximately 100 p.s.i. (165°-170°C.) with approximately 30 minutes to attain the cooking temperature and 10 to 20 minutes to reduce the pressure to about 35 to 40 p.s.i., when the contents were "blown" into a wooden blowpit fitted with a perforated stainless steel false bottom. The pulp was washed in this blowpit by alternate filling with water and draining, the drain liquor passing through a muslin bag to retain any pulp forced through the perforations in the false bottom. When the wash water appeared colorless, the pulp was squeezed in a canvas bag and sampled to determine the overall yield.

B. Screening

The pressed pulp was suspended in water and screened in a laboratory flat screen with 0.004-inch (4-cut) slit openings. The screened pulp was allowed to go over a 100-mesh inclined wire, and the material passing through this wire was collected in a heavy muslin bag and labeled "fines." (A portion of the fines, varying somewhat with the type of material and degree of pulping, was lost through the muslin.) The material remaining on the flat screen was circulated in a small laboratory beater (with sufficient clearance between the roll and bedplate to prevent cutting or extensive beating), to break up some of the cooked fiber bundles not separated by "blowing," and then was rescreened. This additional screened pulp was added to the main portion of the pulp, and the residue on the screen was dried and labeled "screenings."

The screened pulp was pressed, air dried, and sampled for moisture content to obtain yield data.

C. Analyses

The following analyses were made on the screened pulp:

1. *Lignin Content:* The air-dried screened pulp was ground in a Wiley-type cutting mill to pass a screen with openings 1 mm. in diameter and sampled for moisture. Approximately 2 grams of the ground material were weighed accurately and cooled to 15°C. Then 20 ml. of 72%-sulphuric acid (15°C.) per gram of the ground material were added, and the mixture stirred thoroughly till fluid, covered, and left in the refrigerator for a total period of 16 hours. Then the solution was diluted to a 3% acid concentration and boiled actively for 4 hours, keeping the volume constant by the occasional addition of distilled water. After standing on a warm plate for a short period, to allow the lignin to coagulate and settle, the solution was filtered in a tared Gooch crucible containing a pad of washed asbestos. After washing in the crucible, the contents were dried, weighed, and ashed in a muffle furnace at 800°C. The lignin content was reported on an ash-free basis.

2. *Permanganate Number:* This value was determined on the ground pulp in accordance with TAPPI Standard T 214 m-37.

3. *Roe Chlorine Number:* A modification of the Roe *(6)* method was used. It was found necessary to increase the moisture content of the sample from the 55% recommended for wood pulp to 75 to 80%, in order to obtain maximum action of the chlorine in the prescribed 15-minute period. The apparatus used was that described by Bray *(1)* for C&B cellulose, employing a sintered glass crucible. The chlorine gas was passed back and forth through the sample for the whole period. A further modification was the addition of about 5 grams of chlorinated, washed sand to the sample, which was found necessary to reduce packing of the wet pulp and to facilitate passage of the gas through the sample, and thus to result in more uniform chlorination.

4. *Ash Content:* The samples were ashed in a muffle furnace at approximately 800°C.

5. *Single-Stage Bleaching:* The pulps were bleached with calcium hypochlorite, using 3, 6, and 9% available chlorine on the basis of the pulp, and the bleaching periods were 1, 2, and 3 hours at 35° to 40°C. The pulp consistency during bleaching was 3%. The strong hypochlorite solutions prepared contained approximately 20 grams available chlorine and 0.1 gram chlorate chlorine per liter.

Ten grams (moisture-free basis) of the pulp were defibered in a small amount of distilled water and placed in a 1-quart jar. Then the required amount of calcium hypochlorite solution, calcium hydroxide solution, and sufficient water to make a 3% pulp suspension at pH 9+ were added. The jar was covered loosely and placed in a water bath at 35° to

40°C. The samples were agitated occasionally and tested with starch-KI test papers. When the chlorine was exhausted or at the end of the period, whichever came first, the contents of the jar were filtered on a Buchner funnel and washed with small amounts of warm distilled water (35°-40°C.) until the washings were neutral to litmus paper. When the chlorine was not exhausted at the end of the bleaching period, the filtrate and washings were combined and analyzed for residual available chlorine. The bleached pulp was treated with dilute hydrochloric acid (5% HCl, basis pulp) for 5 minutes at room temperature, and then filtered, washed free from Cl ion, and made into handsheets, for brightness tests, on a British sheet machine, using fresh blotting paper for each sheet. An aliquot of the sample was filtered, dried, and weighed to determine loss of pulp in bleaching.

6. *Three-Stage Bleaching:* The three stages consisted of (a) treatment with 60% of the total chlorine as chlorine water for 15, 30, and 60 minutes at 20° to 25°C.; (b) heating the residue with 2% sodium hydroxide (basis unbleached pulp) for 1 hour at 50°C.; and (c) treatment of the residue from (b) with the remaining chlorine as calcium hypochlorite for 1, 2, and 3 hours at 35° to 40° C. The pulp consistency was kept at 3% throughout these treatments, and the total chlorine added to the samples amounted to 3, 6, and 9% on the basis of moisture-free unbleached pulp. In a few instances larger amounts of chlorine were necessary.

(a) Ten grams (moisture-free basis) of the unbleached pulp were defibered in a small amount of distilled water and placed in a 1-quart jar. The calculated amount of chlorine water and sufficient distilled water were added to make a pulp consistency of 3%, and the jar and contents were kept at 20° to 25° C. for the required period, testing frequently with starch-KI test paper. When the chlorine was exhausted or at the end of the period, whichever came first, the jar contents were filtered on a Buchner funnel and washed with small amounts of cold distilled water until the washings had no effect on the starch-KI test paper. The filtrate and washings were combined and analyzed for available chlorine.

(b) The washed residue from (a) was suspended in distilled water, sufficient alkali was added to equal 2% on the basis of the dry unbleached pulp, and the mixture was diluted with distilled water at 50°C. to a 3% consistency, held at this temperature for 1 hour, with occasional stirring, filtered on a Buchner funnel, and washed with distilled water at 50°C. until the wash water was neutral to litmus paper.

(c) The pulp from (b) was treated as in single-stage bleaching with the remaining chlorine as calcium hypochlorite, and the bleached pulp was made into handsheets on a British sheet machine.

7. *Brightness:* The brightness, or percentage reflectance through a blue filter, was determined on the bleached handsheets with a Hunter factory-control reflectometer. This instrument is a simplified modification of the multipurpose reflectometer (*4*).

8. *Alpha-Cellulose:* The alpha-cellulose contents of the bleached and unbleached pulps were determined in accordance with TAPPI Standard T 203 m-40.

TABLE III.—YIELDS, CHARACTERISTICS AND BLEACHABILITIES OF AGRICULTURAL RESIDUE PULPS

Cook number	Material	NaOH used for cooking [1] %	Yields [2]			Pulp Characteristics [2]				Bleached Pulp—70% Brightness (Hunter Reflectometer)			
										Single-Stage		Three-Stage	
			Crude pulp %	Screened pulp %	Screenings %	Ash %	Lignin %	Permanganate number	Roe chlorine number	Chlorine consumption [2] %	Pulp loss in bleaching [2] %	Chlorine consumption [2] %	Pulp loss in bleaching [2] %
17	Rice straw	9	52.4*	35.6	6.5	16.1	6.9	21.4	3.8	14.0	14.0	8.1	18.4
14, 15, 16, 18, 20, 22	Rice straw	12	48.2*	35.7	2.2	15.8	3.5	10.6	2.3	4.9	10.8	3.0	10.2
12	Rice straw	18	43.0*	33.9	0.7	7.1	2.7	7.0	2.1	3.6	7.2	2.7	8.6
11	Rice straw	24	38.8*	30.1	0.2	6.4	2.2	6.5	2.0	3.5	10.7	2.6	10.8
30	Wheat straw...	9	55.4*	30.8	18.6	5.8	8.5	29.3	7.6	21.1	13.0	16.0	8.4
31	Wheat straw...	12	53.8*	34.5	11.0	2.9	5.1	17.7	4.5	12.1	7.0	8.8	7.6
27	Wheat straw...	18	46.4*	38.2	1.6	2.6	2.2	8.9	1.7	6.0	6.2	3.5	12.8
32	Wheat straw...	24	44.5*	37.5	0.6	2.0	1.4	7.9	1.0	3.5	4.7	2.8	4.2
85	Barley straw...	9	51.4	27.7	11.0	6.6	8.3	22.5	7.4	20.9	13.6	14.8	16.6
86	Barley straw...	12	46.1	29.4	5.1	4.3	5.4	16.7	4.6	15.0	12.5	10.5	15.5
87	Barley straw...	15	44.2	31.6	1.2	3.9	4.0	12.3	3.1	10.0	15.0	6.0	17.6
88	Barley straw...	18	42.9	31.7	0.4	4.3	2.8	8.9	2.1	7.6	8.1	4.4	14.3
89	Barley straw...	24	40.7	30.9	0.1	5.5	2.1	7.9	2.0	5.6	5.1	3.6	12.2
164	Rye straw	9	56.3	29.9	12.9	2.3	7.0	24.2	6.4	17.6	7.4	10.6	9.9
161	Rye straw	12	53.1	33.6	5.8	2.8	3.8	14.7	3.1	10.1	12.1	6.0	7.8
162	Rye straw	15	52.0	36.7	1.4	2.8	2.5	10.6	1.5	6.3	9.1	4.3	7.1
163	Rye straw	24	46.8	32.7	0.8	3.4	1.8	8.7	1.2	4.6	5.6	2.9	5.3
165	Oat straw	9	52.7	40.9	2.0	2.3	6.0	17.4	5.5	15.2	7.4	8.7	8.5
172	Oat straw	12	52.4	39.1	2.7	2.7	3.9	13.1	3.4	9.7	8.4	6.1	10.2
167	Oat straw	15	51.0	40.9	0.6	3.1	2.5	9.9	1.8	6.3	4.9	3.9	6.1
168	Oat straw	18	48.0	38.6	0.6	3.4	2.0	8.1	1.6	4.1	3.5	3.1	5.2
169	Oat straw	24	44.0	35.7	0.2	3.7	1.9	7.9	1.4	3.5	3.3	2.7	4.9
170	Seed flax shives	9	69.6	8.8	48.1	4.7	14.2	28.1	10.7	...	...	...	...
171	Seed flax shives	12	64.7	7.7	47.6	4.4	10.6	25.5	8.7	...	...	...	...
173	Seed flax shives	15	55.7	8.1	39.7	5.2	8.2	25.3	7.6	...	...	20.9	20.9
174	Seed flax shives	18	54.4	9.2	36.2	4.9	7.4	22.6	6.1	27.1	12.9	14.6	19.4
175	Seed flax shives	24	47.6	12.7	27.0	4.9	6.7	23.5	4.3	21.1	12.2	12.5	16.0
176	Seed flax shives	30	42.2	25.6	8.7	4.1	7.7	25.4	4.5	17.7	10.8	10.3	14.2
177	Seed flax shives	40	35.6	23.6	2.0	3.8	2.5	12.3	2.3	6.5	7.5	4.5	7.7
178	Soybean stalks.	9	69.8	10.7	48.3	2.4	19.0	33.0	16.5	...	...	...	...
179	Soybean stalks.	15	62.4	13.0	39.9	2.7	14.7	33.4	13.8	...	...	29.3	20.0
182	Soybean stalks.	18	57.5	15.0	33.7	3.6	10.9	26.9	8.0	30.0	15.5	17.2	17.9
180	Soybean stalks.	24	48.9	16.3	26.8	4.5	6.8	20.6	3.8	21.6	13.1	10.3	15.0
181	Soybean stalks.	30	45.7	26.6	8.8	4.0	5.1	18.3	2.5	13.8	12.1	7.8	12.5
183	Soybean stalks.	40	42.5	30.9	1.1	3.7	3.4	14.7	1.5	7.8	9.4	5.4	10.2

* Obtained by summation of screened pulp, screenings and recovered fines. Does not include fines lost in screening.
[1] Basis moisture-free raw material.
[2] Basis moisture-free screened pulp.

Results and Discussion

Raw Materials

The data in Table II show that these raw materials resolve themselves into two classes—one, including all of the cereal straws, and the other, the flax shives and soybean stalks. The cereal straws generally show higher 1% alkali solubility, pentosan, and C & B cellulose contents and lower lignin contents than the flax shives or soybean stalks. The sums of the alpha-cellulose and pentosans in the C & B cellulose of the cereal straws are practically equal to 100%. In the case of the flax shives and soybean stalks, however, these constituents add up to only 91 and 94%. With the exception of the barley straw, the cereal straws have higher alpha-cellulose contents than the flax shives or soybean stalks.

All of the C & B pulps contained 22 to 30% pentosans. This is of interest in that it shows that approximately half of the pentosan contents of these agricultural residues are resistant to the mild alternate acid and alkaline treatments involved in this method of isolation. The difference between the two classes of residues is again apparent, since nearly 60% of the flax shive and soybean straw pentosans are eliminated, as against 44 to 49% of the cereal straw pentosans.

Pulp Yields

The yields of crude pulp, screened pulp, and screenings are given in Table III. The calculated crude pulp yields from the rice and wheat straws are low because they do not take into account the considerable portion of the fines lost during screening. The total fines produced in the other cooks may be obtained by subtracting the sums of the yields of screened pulps and screenings from the yields of crude pulp.

Fair yields of usable screened pulp were obtained from the cereal straws with the lower alkali concentrations, but considerably higher concentrations of chemical were required to obtain flax and soybean pulps. The irregularity in screened pulp yields from

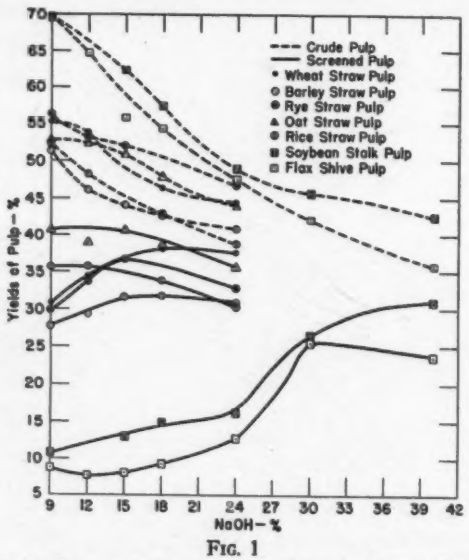

Fig. 1

Yields of Crude and Screened Pulps from Agricultural Residues Cooked with Varying Amounts of Caustic Soda

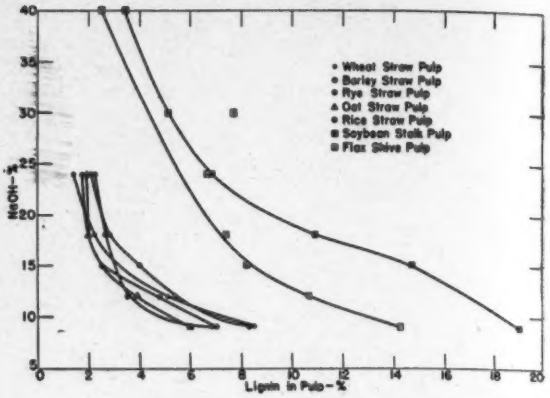

Fig. 2

Variation of Lignin Content of Agricultural Residue Pulps with Concentration of Alkali Used for Cooking

flax shives and soybean stalks is probably due to the rawness of these pulps.

The yields of screened pulp increased somewhat in the order: barley, rice, rye, wheat, and oat, in the case of the cereal straws, as shown in Fig. 1. Larger yields of screened pulp were obtained from the soybean stalks than from the flax shives under comparable cooking conditions. The amounts of screenings obtained from the flax shives and soybean stalks were practically identical for the cooks made with equal alkali concentrations. For the cereal straws the screenings increased at the lower alkali concentrations in the order: oat, rice, barley, rye, and wheat; but at the higher concentrations the screenings were all low.

The fines (obtained by subtracting the screened pulp and screenings from the crude pulp, and including the material lost through the muslin bag) averaged 11.2% for barley, 13.6% for rye, 9.4% for oat, 9.0% for flax shives, and 9.2% for soybean stalks. The figures for wheat and rice pulp fines are not included due to the fact that the fines lost through the muslin bag were not determined.

Ash in Pulps

The ash contents of the pulps, shown in Table III, varied from about 2 to 5% with the exception of the rice straw pulp. The increasing concentration of alkali used for cooking resulted in increasing ash contents of the rye, oat, barley, and soybean pulps; in practically no change in the flax shive pulp; and in decreasing ash contents of the rice and wheat pulps.

Lignin in Pulps

Lignin determinations made on the screened pulps are shown in Table III. The variations in lignin content of the screened pulps with the concentration of alkali used for cooking are shown in Fig. 2. Here, also, the agricultural residue pulps fall into two groups, cereal straw pulps and those from flax shives and soybean stalks. It is difficult to explain the lignin content of the flax shive pulp obtained by cooking with 30% caustic soda. It is possible that a large portion of the screenings from this cook was broken up in the beater to pass the 4-cut screen. This high-lignin material, added to the bulk of the screened pulp, would probably raise the lignin content of the mixture above that of the original screened pulp. It must be noted that the lignin and other de-

terminations were checked repeatedly, particularly in cases like this where the first results obtained appeared questionable.

Bleach Consumption of Pulps

In order to compare the bleachability of the pulps with lignin and other pulp characteristics, the necessary bleach consumption for each pulp to give a brightness of 70% on the Hunter reflectometer was chosen. The data on the bleach consumptions and pulp losses for the various pulps at this brightness are given in Table III. (Individual bleaching data for three sample cooks are shown in Table VII, and will be discussed later in connection with the effect of bleaching on the alpha-cellulose contents of the pulps.)

The bleach consumption of the various pulps plotted against the lignin contents of these pulps are illustrated in Fig. 3 for single-stage and 3-stage bleaching. The linear relationship between these two characteristics is expressed by the factor, 2.51:1 as the ratio of bleach consumption to lignin content for single-stage bleaching, and of 1.66:1 for 3-stage bleaching. Most of the individual experimental values fall closely to the line expressing the average values, particularly in the region of lower lignin contents. This indicates that irrespective of the type of agricultural raw materals used in these studies, with the exception of rice straw, the bleach consumption is a direct function of the lignin content of pulps produced under similar conditions of soda pulping.

The bleach consumption-lignin ratio for rice straw pulp was considerably lower than the average ratio for the other pulps as shown in Fig. 3, varying from 54 to 81% of the average values obtained for the other pulps of similar lignin content in single-stage hypochlorite bleaching. Even greater economy of chlorine was obtained in 3-stage bleaching. This difference in the behavior of rice straw pulp in bleaching may be due to the high silicious ash content of this material. The silica content of the ash from rice straw and rice straw pulp was 60 to 90%. This relatively high amount of silica in the pulp may function similarly to sodium silicate, cited by Jeglum

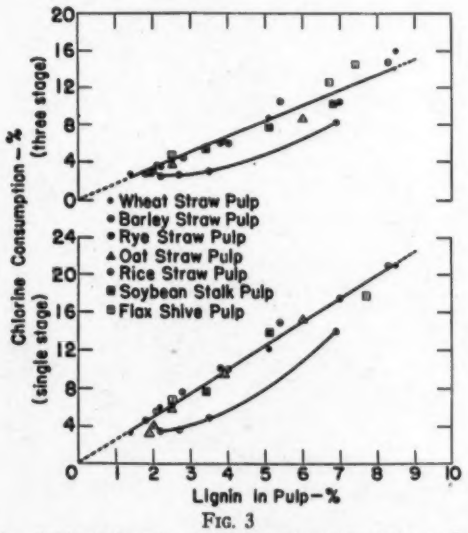
Chlorine Consumption – % (three stage)
Chlorine Consumption – % (single stage)
• Wheat Straw Pulp
• Barley Straw Pulp
• Rye Straw Pulp
▲ Oat Straw Pulp
• Rice Straw Pulp
■ Soybean Stalk Pulp
□ Flax Shive Pulp
Lignin in Pulp – %

Fig. 3

Relation of Lignin Contents of Agricultural Residue Pulps to Bleach Consumption in Single- and Three-Stage Bleaching to 70% Brightness (Hunter Reflectometer)

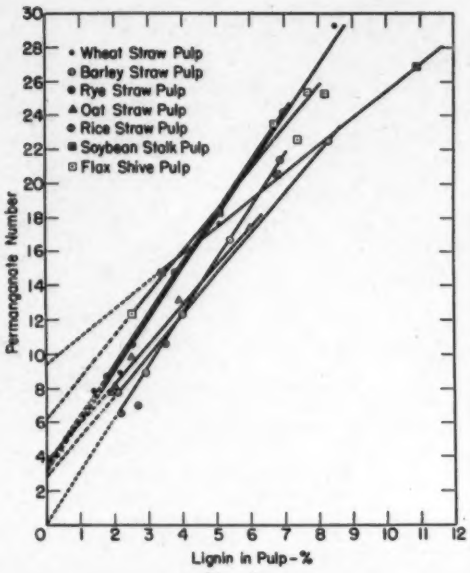

Fig. 4

Relation of Permanganate Number to Lignin Content of Various Agricultural Residue Pulps. (Note the Different Slopes of the Lines and Their Intercepts on the Vertical Axis)

(5), in reducing the chlorine consumption of the pulp.

The losses of pulp substance in bleaching to 70% brightness generally decrease with increasing degree of pulping, as shown in Table III. Some of the irregularities in these values, as indicated in Cooks 12, 27, 87, and 172, may be due to errors in sampling the small amounts of bleached pulps.

Permanganate Number of Pulps

The permanganate number of the pulps is given in Table III. These values decrease regularly with increasing concentration of chemical or degree of cooking, except in the case of the flax shive pulps. With the latter material there is no such correlation until 30% caustic soda was used for pulping.

The relationship of the permanganate number with lignin and with bleach consumption of the various pulps is illustrated in Figs. 4 and 5. The relationship between lignin and permanganate number is rectilinear and different for each type of raw material, as indicated by the slopes of the various lines (Fig. 4). The broken lines extending from the lowest experimental values to the vertical axis intercept the latter above the zero point in all cases except rice straw pulp. The intercepts on the vertical axis for the various pulps are: rice, 0; barley, 2.8; wheat, 3.2; rye, 3.3; oat, 3.7; flax shive, 6.2; and soybean stalk, 9.4. These intercepts are measures of the permanganate demands of the various pulps in the lignin-free, or almost lignin-free, condition. Note that the cereal straw pulps, with the exception of rice straw pulp, all have intercepts in the narrow range of 2.8 to 3.7. This range also covers the permanganate values of highly purified commercial pulps of very low lignin content; for example, a commercial spruce alpha pulp had a permanganate number of 3.5 and bleached filter paper had a value of 1.9.

Here again there seems to be a distinct classification of the pulps into two groups.

The slopes of the lines plotted from experimental data in Fig. 4 may be expressed by the equation:

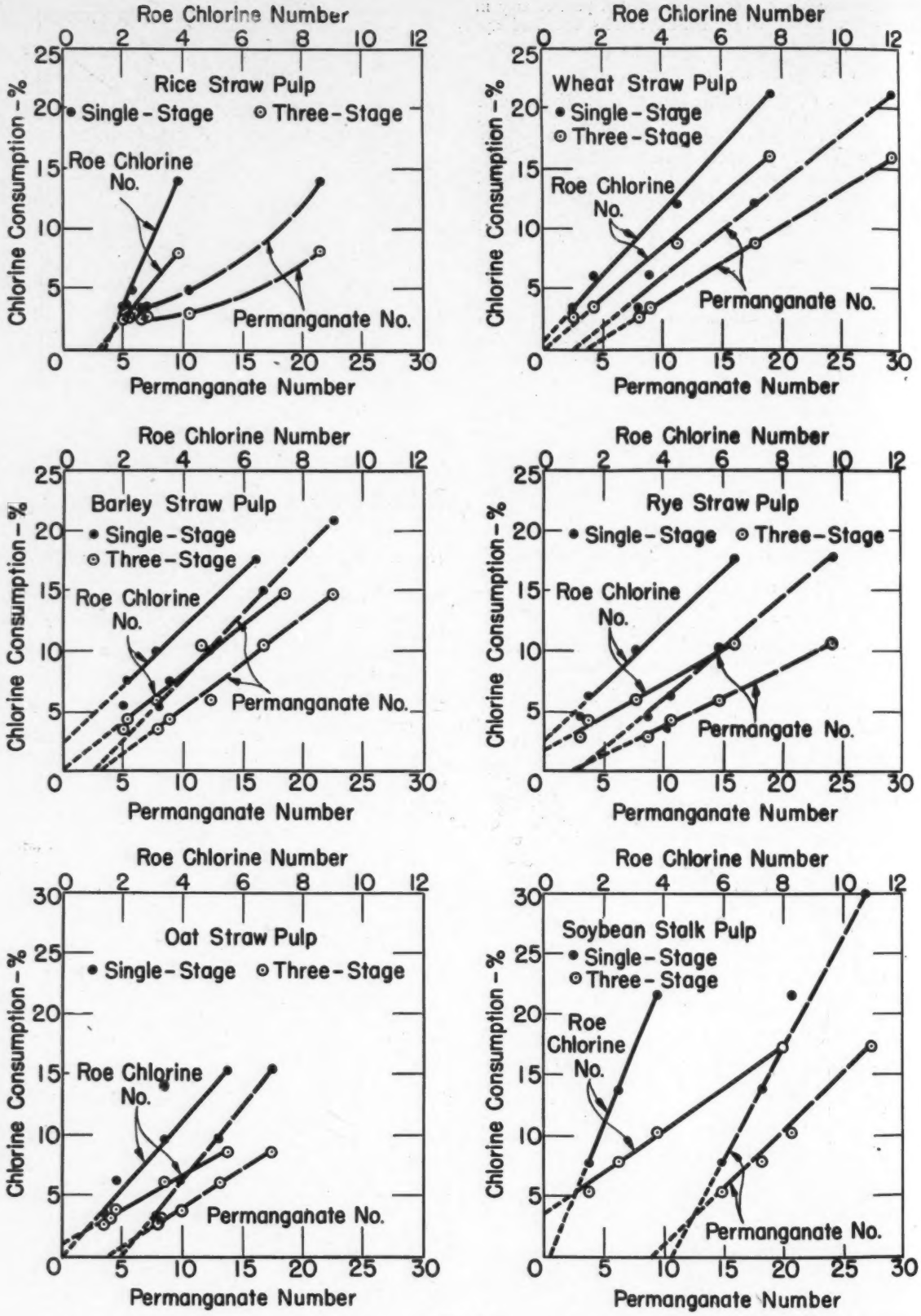

FIG. 5

Relation of Permanganate Number and Roe Chlorine Number to Bleach Consumption (Single- and Three-Stage) of Agricultural Residue Pulps Required to 70% Brightness (Hunter Reflectometer)

$S = K\text{-}I_k/L$, where S is the slope, K is the observed permanganate number, I_k is the intercept value for the particular pulp, and L is the lignin content of the pulp in percentage. The experimental values for the slopes obtained for the various pulps are: rice, 3.1; barley, 2.4; wheat, 3.0; rye, 3.0; oat, 2.3; flax shive, 2.4; and soybean stalk, 1.6. It will be noted that these slopes segregate the pulps into three groups, consisting of: rice, wheat, and rye in one; barley, oat, and flax shive in another; and soybean stalk in the third.

This equation presents some interesting possibilities. For instance, given the permanganate number of a known pulp of the above groups produced by the soda process, it may be possible to calculate its lignin content within reasonably close limits. These data applied to relatively large (10-20 pound) batches of rice and barley straw pulps, prepared and bleached in connection with another problem, gave the results shown in Table IV.

TABLE IV.—RELATIONSHIP OF PERMANGANATE NUMBER AND LIGNIN CONTENT OF PULPS

$\left(L = \frac{K - I_k}{S}\right)$

Pulp	Observed $KMnO_4$ Number	Observed Lignin Content	Calculated Lignin Content
Rice	7.68	2.56	2.48
	7.51	2.67	2.42
	7.55	2.48	2.44
	7.27	2.42	2.35
	6.29	2.15	2.03
	6.85	2.38	2.21
Barley	11.96	3.49	3.81
	11.79	3.76	3.75
	11.94	3.47	3.81

The differences between the observed and calculated values for lignin are practically within the experimental error of the analytical methods used.

The relationships of the various pulps between the permanganate number and chlorine consumption (brightness 70%) are also rectilinear, with the exception of that for the rice pulp, as shown in Fig. 5. The

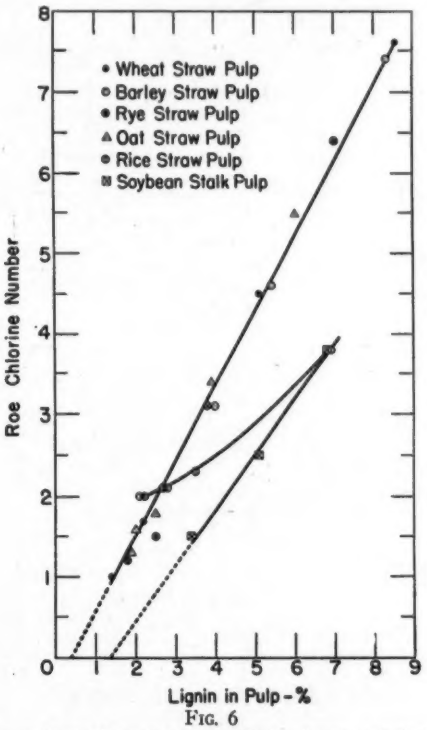

FIG. 6

Relation of Lignin Content to Roe Chlorine Number of Agricultural Residue Pulps

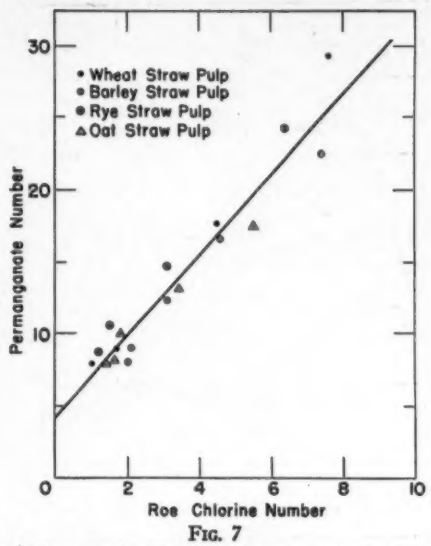

FIG. 7

Relation of Roe Chlorine Number to Permanganate Number of Agricultural Residue Pulps

data for the flax shive pulps were not included due to the relatively small quantities of uniformly cooked pulp obtained. Again, as in Fig. 3, the chlorine consumption-permanganate number relationship for rice straw pulp is definitely curvilinear, due perhaps to the high silicious ash contents of the rice pulps.

The intercepts and slopes of the lines for the other straw pulps and soybean stalks are given in Table V.

TABLE V.—RELATIONSHIP OF CHLORINE CONSUMPTION TO PERMANGANATE NUMBER ($S_1 = C/K - I_k$)

	Single-Stage Bleaching		Three-Stage Bleaching	
Pulp	Intercept on $KMnO_4$ Axis (I_k)	Ratio Cl:$KMnO_4$ No. (S_1)	Intercept on $KMnO_4$ Axis (I_k)	Ratio Cl:$KMnO_4$ No. (S_1)
Barley	2.8	1.04	3.2	0.77
Wheat	2.5	0.77	3.5	0.62
Rye	3.3	0.86	3.0	0.50
Oat	4.8	1.22	3.4	0.64
Soybean stalk ..	10.4	1.83	10.0	1.00

The intercepts of these lines on the permanganate axis are approximately the same as those obtained for the lignin-permanganate number relationships. However, the slopes of these lines, obtained by the equation $S = C/K\text{-}I_k$, where C is the chlorine consumption required to reach a brightness of 70%, apparently do not group themselves in the same manner as in the case of the lignin-permanganate number relationships. Examination of the data in Table V reveals the raw material individuality. The ratio of chlorine consumption to permanganate number for oat straw pulp in single-stage bleaching is nearly double that for three-stage bleaching, while in the case of wheat straw pulp this ration is only about 25% higher. The corresponding ratio increases for the other pulps are: barley, 35%; rye, 72%; and soybean, 83%.

Roe Chlorine Number of Pulps

The Roe chlorine number of the pulps is given in Table III, and the relationships of their values to the lignin contents of the pulps are shown in Fig. 6. The wheat, barley, rye, and oat pulps fall into one group; whereas the rice and soybean pulps give lines with quite different slopes. The line for all of the cereal straw pulps, except for rice, cuts the lignin axis, but so closely to the origin that the small deviation may or may not be significant. The slope of this line (ex-

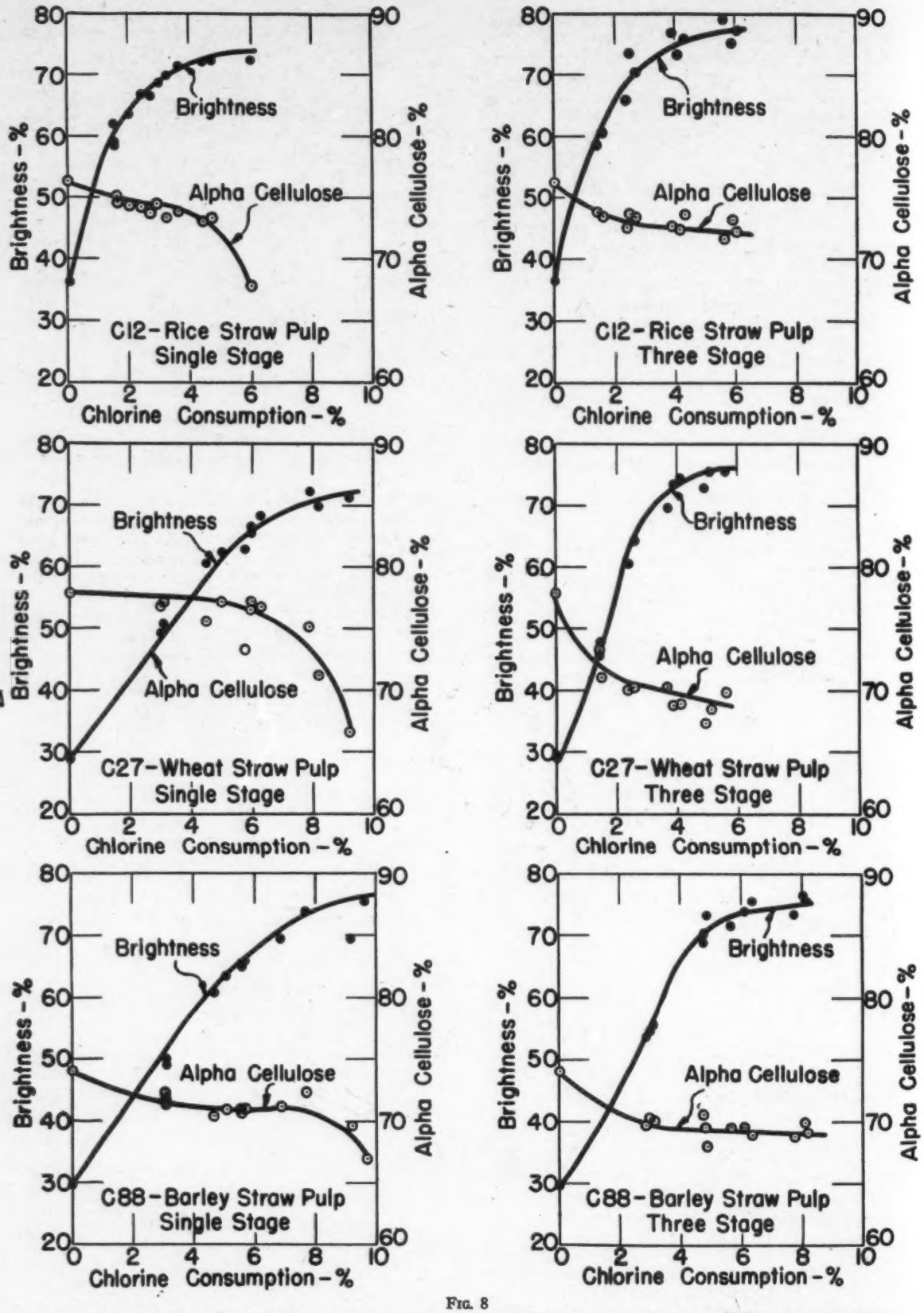

FIG. 8

Relationship of Brightness and Alpha-Cellulose Content of Bleached Pulp with Bleach Consumption in Single- and Three-Stage Bleaching.

TABLE VI.—RELATIONSHIP OF CHLORINE CONSUMPTION TO ROE CHLORINE NUMBER ($S_2 = C - I_v/R - I_h$)

	Single-Stage Bleaching			Three-Stage Bleaching		
	Intercept on		Ratio Cl Consumption to Roe Number	Intercept on		Ratio Cl Consumption to Roe Number
Pulp	Vertical Axis (I_v)	Horizontal Axis (I_h)	(S_2)	Vertical Axis (I_v)	Horizontal Axis (I_h)	(S_2)
Barley	1.5	..	2.6	..	..	2.0
Wheat	1.0	..	2.7	..	..	2.1
Rye	2.5	..	2.3	1.5	..	1.5
Oat	..	..	3.0	..	..	1.6
Rice	..	3.5	6.2	..	3.0	3.1
Soybean	..	0.5	6.0	2.0	..	2.2

perimental ratio, Roe chlorine number: lignin content) is 0.94, and the intercept on the lignin axis is 0.4. The lignin content of the pulp may thus be estimated directly from the Roe chlorine value by the equation: $L = R/0.94 + 0.4$, where L is the lignin content, and R is the chlorine number of the pulp. The slope of the line for soybean pulp is 0.68 and the intercept of this line with the lignin axis is 1.3.

A curvilinear relationship between the lignin content and Roe chlorine number was obtained for rice straw pulp, as shown in Fig. 6. Apparently the action of chlorine, as well as that of hypochlorite, is affected by the same factor, possibly the high silicious ash of the rice straw.

The relationship between the Roe chlorine number and chlorine consumption of the various pulps for attaining a brightness of 70% are shown in Fig. 5. In this case, some of the lines depicting these relationships cut the vertical as well as the horizontal axis. The intercepts of these lines on both axes and the slopes of the lines are given in Table VI.

These slopes may be expressed by the equation: $S_2 = C\text{-}I_v/R\text{-}I_h$, where R is the Roe chlorine number, I_v is the intercept on the vertical (chlorine consumption) axis, and I_h the intercept on the horizontal (Roe chlorine number) axis.

The Roe chlorine number may also be expressed in terms of the permanganate number and vice versa. From the Roe chlorine number-lignin relationship, the value for lignin L is expressed by the equation: $L = R/0.94 + 0.4$, where R is the Roe chlorine number. The same value from the permanganate number-lignin relationship may be derived from the equation: $L = K\text{-}I_h/S$, where K is the permanganate number, I_h the intercept on the permanganate axis, and S the slope of the permanganate number-lignin line.

$$L = \frac{R}{0.94} + 0.4 = \frac{K - I_h}{S} \quad (1)$$

$$R = 0.94\,\frac{(K - I_h)}{S} - 0.4 \quad (2)$$

$$K = S\left(\frac{R}{0.94} + 0.4\right) + I_h \quad (3)$$

Substituting arbitrary values for permanganate number K in Equation 2 for oat, wheat, rye, and barley pulps, and solving for Roe chlorine number gave average values, R, of 0.23, 2.0, 5.6, and 9.1 for the permanganate numbers of 5, 10, 20, and 30, re-

TABLE VII.—EFFECT OF SINGLE-STAGE AND THREE-STAGE BLEACHING ON LOSS OF PULP SUBSTANCE, AND ON BRIGHTNESS AND ALPHA-CELLULOSE CONTENT OF BLEACHED AGRICULTURAL RESIDUE PULPS

	Single-Stage Bleach							Three-Stage Bleach							
	$Ca(OCl)_2$				Alpha-Cellulose			Chlorine Water		$Ca(OCl)_2$				Alpha-Cellulose		
Material	Time of bleach, hr.	Chlorine added, %[1]	Total chlorine consumption,[*] %	Pulp loss in bleaching, %[1]	Basis bleached pulp, %	Basis screened pulp, %	Brightness, %	Time of bleach, min.	Chlorine added, %[1]	Time of bleach, hr.	Chlorine added, %[1]	Total chlorine consumption,[*] %	Pulp loss in bleaching, %[1]	Basis bleached pulp, %	Basis screened pulp, %	Brightness, %
Rice Straw Cook 12	..	..	..	..	....	76.3	36.5	..	..	..	..	..	..	....	76.3	36.5
	1	1.5	1.6	4.5	78.5	75.0	58.4	15	0.9	1	0.6	1.4	7.9	80.1	73.8	58.9
	2	1.5	1.6	4.7	78.4	74.6	58.3	30	0.9	2	0.6	1.6	8.0	79.9	73.5	60.6
	3	1.5	1.6	5.5	78.8	74.5	61.9	..	..	.	..	..	..	....	....	....
	1	3.0	2.0	5.9	79.1	74.4	63.8	15	1.8	1	1.2	2.4	9.2	80.1	72.7	66.0
	2	3.0	2.4	5.7	78.7	74.2	66.4	30	1.8	2	1.2	2.7	8.6	80.5	73.5	70.4
	3	3.0	2.9	5.5	78.8	74.5	68.3	60	1.8	3	1.2	2.5	8.9	80.9	73.7	73.7
	1	6.0	2.7	6.4	78.7	73.7	66.8	15	3.6	1	2.4	4.1	10.4	80.9	72.5	73.2
	2	6.0	3.6	5.7	78.4	73.9	71.3	30	3.6	2	2.4	4.3	10.0	81.9	73.7	75.9
	3	6.0	4.7	7.2	79.1	73.3	72.5	60	3.6	3	2.4	3.9	11.5	82.1	72.6	77.4
	1	9.0	3.2	7.4	79.3	73.4	70.0	15	5.4	1	3.6	5.9	10.2	81.8	73.4	75.3
	2	9.0	4.4	6.5	78.3	73.2	72.4	30	5.4	2	3.6	6.0	11.7	82.0	72.3	77.2
	3	9.0	6.0	9.9	75.4	67.9	72.2	60	5.4	3	3.6	5.6	11.7	81.2	71.7	79.0
Wheat Straw Cook 27	..	..	..	..	....	77.9	29.0	..	..	.	..	..	..	....	77.9	29.0
	..	..	..	..	....	....	....	15	0.9	1	0.6	1.4	9.1	80.6	73.3	45.7
	..	..	..	..	....	....	....	30	0.9	2	0.6	1.5	12.0	80.7	71.1	47.9
	1	3.0	3.0	5.0	81.0	76.9	49.8	15	1.8	1	1.2	2.4	12.7	80.3	70.1	60.5
	2	3.0	3.1	4.5	80.8	77.1	50.8	30	1.8	2	1.2	2.6	12.5	80.3	70.3	64.4
	1	6.0	4.5	4.9	79.5	75.6	60.7	15	3.6	1	2.4	3.7	12.8	80.6	70.3	69.6
	2	6.0	5.8	7.9	79.6	73.3	62.9	30	3.6	2	2.4	3.9	13.3	79.5	68.9	73.5
	3	6.0	6.0	4.5	80.8	77.2	66.5	60	3.6	3	2.4	4.1	13.3	79.5	68.9	74.6
	1	9.0	5.0	4.5	80.9	77.3	62.5	15	5.4	1	3.6	4.9	15.1	79.4	67.4	72.9
	2	9.0	6.3	4.7	80.6	76.8	68.4	30	5.4	2	3.6	5.1	13.7	79.4	68.5	75.6
	3	9.0	7.9	5.1	79.1	75.1	72.2	60	5.4	3	3.6	5.6	14.2	81.5	69.9	75.8
	1	12.0	6.0	5.8	81.2	76.5	65.5	..	..	.	..	..	....	....	....	....
	2	12.0	8.2	7.0	76.7	71.3	69.9	..	..	.	..	..	....	....	....	....
	3	12.0	9.2	7.7	72.2	66.6	70.6	..	..	.	..	..	....	....	....	....
Barley Straw Cook 88	..	..	..	..	....	74.7	29.8	..	..	..	..	..	..	....	74.7	29.8
	1	3.0	3.1	7.6	77.4	71.5	49.3	15	1.8	1	1.2	2.9	9.4	77.1	69.8	53.8
	2	3.0	3.1	7.4	77.7	72.0	49.7	30	1.8	2	1.2	3.0	9.0	77.3	70.4	54.4
	3	3.0	3.1	7.4	77.9	72.2	49.4	60	1.8	3	1.2	3.1	9.6	77.6	70.1	55.2
	1	6.0	4.7	8.7	77.3	70.5	60.9	15	3.6	1	2.4	4.8	10.4	77.7	69.5	68.9
	2	6.0	5.6	7.7	76.9	71.0	65.8	30	3.6	2	2.4	4.8	9.6	78.2	70.6	70.1
	3	6.0	5.7	8.4	77.5	71.0	66.0	60	3.6	3	2.4	4.9	13.0	78.2	68.0	73.2
	1	9.0	5.1	8.4	77.6	71.1	63.4	15	5.4	1	3.6	5.7	10.9	78.0	69.6	71.6
	2	9.0	6.9	8.1	77.4	71.1	69.4	30	5.4	2	3.6	6.1	11.1	78.4	69.6	73.9
	3	9.0	7.7	7.5	78.2	72.4	74.0	60	5.4	3	3.6	6.4	11.6	78.1	69.0	75.8
	1	12.0	5.6	8.7	77.6	70.8	65.1	15	7.2	1	4.8	7.8	11.2	77.5	68.8	73.3
	2	12.0	9.2	8.7	76.4	69.7	69.4	30	7.2	2	4.8	8.2	11.9	78.4	69.1	75.3
	3	12.0	9.7	9.7	74.3	67.0	75.2	60	7.2	3	4.8	8.1	11.5	79.1	70.0	76.5

[*] Chlorine consumption calculated on basis of ash-free screened pulp.
[1] Basis moisture-free screened pulp.

spectively. The straight line obtained from these values is shown in Fig. 7. The actual experimental values are seen to fall very close to the calculated line.

It should be stated at this point that, while the formulas appear to be valid for the lignin-permanganate number—Roe number—bleach consumption relationships of the soda pulps used in this study, they are based on an insufficient amount of data to permit of their general application. They are included in this paper because they fit the data obtained under the controlled laboratory and pilot plant conditions for soda pulping used in this work, and because, if substantiated by further work, they open up interesting possibilities for general use for evaluating pulp relationships.

Bleach Consumption and Alpha-Cellulose

In order to determine the effect of the bleaching on the alpha-cellulose in the pulp, determinations were made on rice, wheat, and barley pulps bleached to various degrees by the two types of bleaching. Complete data are given in Table VII. The bleach consumption-brightness-alpha-cellulose relationships are illustrated in Fig. 8. These data show that the pulp brightness increases rapidly with chlorine consumption until a brightness of about 70% is attained. The rate of increase in brightness is greater in three-stage than in single-stage bleaching. Beyond about 70%, the brightness increases but little or not at all with increasing chlorine consumption. The loss of pulp substance increases somewhat with increased bleach consumption.

The larger losses shown for three-stage bleaching are probably due to the action of the caustic in the intermediate stage.

It may be readily seen from Fig. 8 that three-stage bleaching results in considerable economy of chlorine, particularly in the wheat and barley straw pulps. It is also apparent that rice straw pulp consumes less chlorine than the other pulps for attaining a given brightness, especially in single-stage bleaching.

Single-stage bleaching degrades the alpha-cellulose to a lesser extent than three-stage bleaching up to a bleached pulp brightness of about 70%. It is evident, however, from the data in Fig. 8 that, in order to prevent undue degradation of the alpha-cellulose, the multistage methods of bleaching should be used for obtaining brightness higher than 70% with agricultural residue soda pulps.

Acknowledgment

The authors wish to acknowledge the assistance of Alan Rhodes and Leroy F. Pease of the Pulp and Paper Section, Agricultural Residues Division, in carrying out the work described in this paper.

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Hold Joint Meeting at Glens Falls

Forty-six members of the paper and allied industries met at 7:00 P.M. in the Queensbury Hotel at Glens Falls, N. Y. on Friday, December 3, for the second meeting of the season of Tappi and the Superintendents' Association of the Glens Falls area. After dinner two navy films "Nazi Long Range Bomber" and "December 7th" were shown through the courtesy of The Sandy Hill Iron & Brass Works.

The topic of the evening was 'Deinking'. A paper on the subject was presented by Ronald Hynes, manager of the Newton Falls Paper Company of Newton Falls, N. Y. After the paper Mr. Hynes was kept busy answering questions for over an hour.

Richard Tutt, Jr. of Philadelphia spoke briefly on the recent experiments made by the *Daily News* of New York in using both de-inked and unde-inked news in making newsprint. Gus Holm of Syracuse questioned the value of this experiment stating that everyone knew that it could be done and had been done during the last war. The only trouble was that there was not enough old news to supply the newsprint mills and that the waste paper dealers would give all they could get to the board mills as they buy year in and year out.

The following were present at the meeting: Appleton Wire Works, Smith McLandress; APW Paper Company, Walter E. Woods, Julius Fincken; Peter Cooper Corporation, Richard Tutt, Jr.; Crown Willamette Paper Company, George Charters; Derrico Company, Inc.—Gus R. Holm; E. I. du Pont—G. E. Osterheldt, H. L. Mellen; Finch, Pruyn Company, W. I. Wynne-Roberts, A. L. Moser and R. D. Moynihan.

Fort Orange Paper Company, T. E. Button, Joseph Quinn; International Paper Company, James E. Reareon, Edward Simmons, Franklin Darrell, Carl Simmons, Robert Drummond, K. A. Taylor, Vance P. Edwards, F. J. McCourt, Curtis Duell, George Pountain, and C. E. Youngchild.

Marinette Paper Company, I. W. Palmer, R. E. Neilson, Bernard McCabe, George Wolfe, Alan Gray, Rollin Crowley, Lawrence Thompson, Michael Gormley and Henry Fales.

Newton Falls Paper Mill, Ronald Hynes, John Rich; The Sandy Hill Iron and Brass Works—H. W. Freeman, William Leeson, Loren Gallup, Reginald Thompson, and Foster P. Doane, Jr.

Stebbins Engineering and Manufacturing Company—Peter Abel; Trimbey Machine Works—M. G. Tibbetts and T. A. Gastonguay; Union Bag and Paper Corporation, B. K. Clifford and Lawrence Ross.

The next meeting is scheduled for Friday, January 14, at the Queensbury Hotel in Glens Falls.

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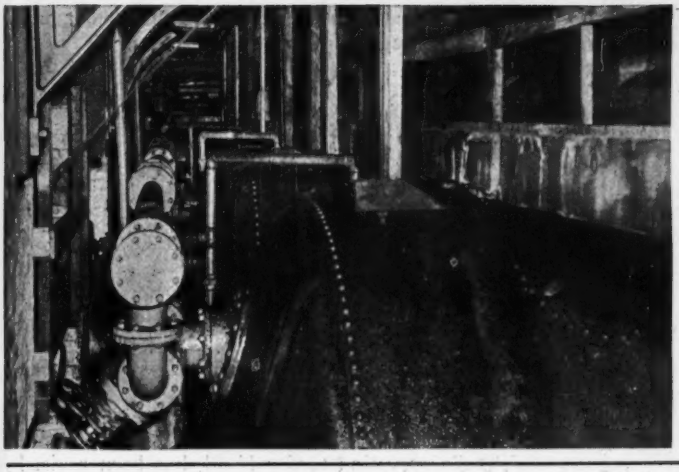

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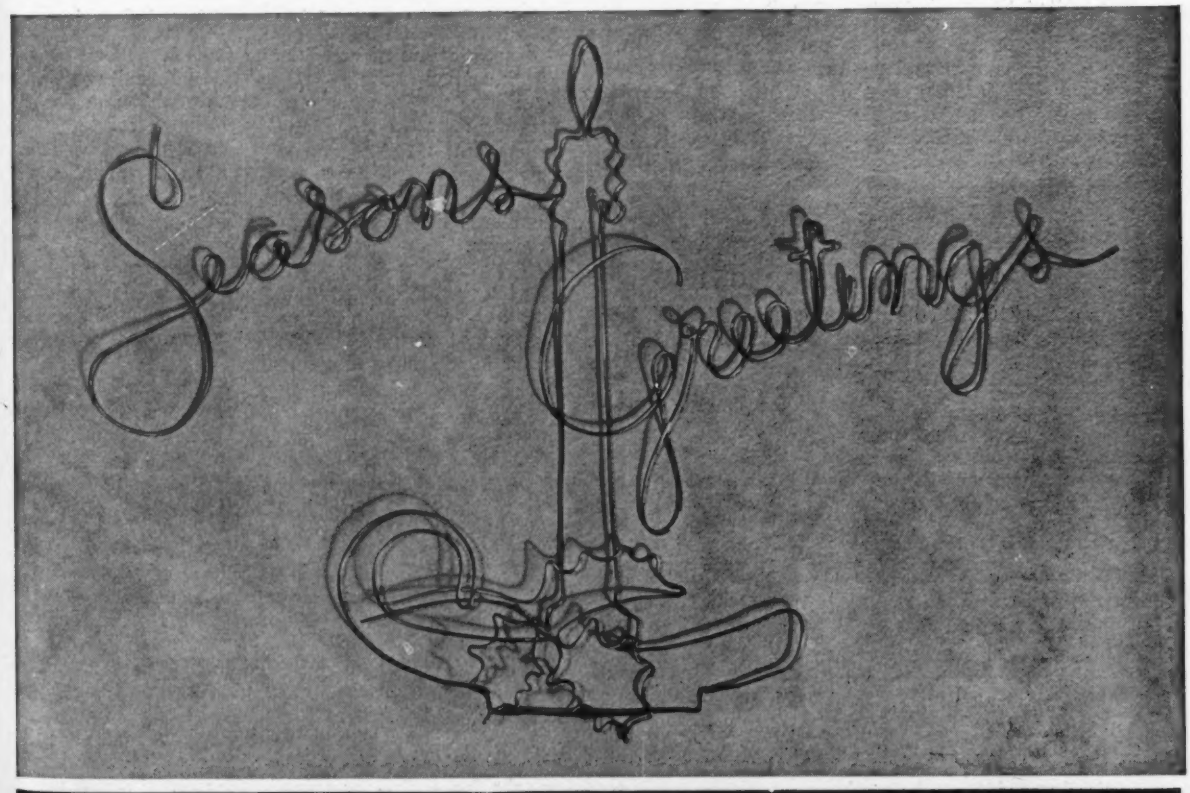

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New York Paper and Pulp Market Review

New WPB Order Limits Use of Paper By Printers To Amount Used In 1941—Paper Market Active—Pulpwood Receipts For Year To November 30% Under 1942 — Waste Paper Demand Urgent.

Office of the PAPER TRADE JOURNAL.
Wednesday, December 15, 1943.

Orders for paper in the wholesale market continues heavy, with the supply inadequate to meet all demands. Opinion expressed in most of many reports received this week from manufacturers' representatives, jobbers, and general paper merchants, is that a definite and drastic allocation of paper by end-use classification is impending. This has also been the prevailing expectation in the industry for some time and has been studied by the WPB for adoption as the necessities of war shall determine.

The index of general business activity for the week ended December 4 rose to 148.7, from 147.2 for the previous week, compared with 133.7 for the corresponding week last year. The index of paper board production was 154.0, compared with 159.9 for the preceding week, and with 134.5 for the corresponding week last year.

Paper production for the week ended December 4 was estimated at 91.7%, compared with 84.9% for 1942, with 107.0% for 1941, with 85.3% for 1940, and with 96.6% for the corresponding week for 1939.

Paper board production for the week ended December 4 was 95.0%, compared with 82.0% for 1942, with 102.0% for 1941, with 78.0% for 1940, and with 79.0% for the corresponding week for 1939.

WPB Limitation Order L-241, amended December 8, 1943, limits the amount of paper which a printer may use for commercial printing, which amount will be his quota, based upon the amount used in 1941. The order does not cover paper or paper board which has been manufactured before October 21, 1943, provided the printing of such product is completed by March 15, 1944.

Wood Pulp

Pulpwood receipts for the first ten months of 1943 aggregated 12,142,000 cords, compared to a consumption of 12,440,000 cords. This compares with receipts of 16,710,000 cords and a consumption of 16,845,000 cords in the like period in 1942.

A serious shortage of pulpwood, a short wood pulp supply and a drastic curtailment of paper seems inevitable unless the harvest of pulpwood this winter can supply most of the pulpwood deficiency.

Mill inventories of wood pulp on November of this year are reported in some quarters to have decreased about half from January 1, 1943.

Rags

Mill buying of new white and light colored cuttings is active and continues to absorb a substantial tonnage of the rather limited supplies. Prices are strong and unchanged.

Roofing mills are steadily buying the low grades of old cotton rags. Full ceiling prices prevail and the market is very firm.

Old Rope and Bagging

Mill demand for old Manila rope continues urgent nd all available supplies of this fiber are quickly absorbed. All papermaking fibers are in heavy demand. Prices are strong and unchanged.

Trading in scrap bagging is currently reported to have declined in volume. This is attributed to a seasonal falling off in demand by southern consumers. Prices are still indefinite and continue of a nominal nature.

Old Waste Paper

Mill requirements for paper stock continue urgent and heavy. Encouraging reports are being received from the nation-wide drives to collect more waste paper from cities. As the bulk of the waste collected will largely consist of the low bulky grades, a tight supply situation is regraded as likely to develop in the higher grades, such as shavings and cuttings. The market is very strong and ceiling prices prevail.

Twine

WPB Conservation Order M-84, has been revised to include the directive prohibiting certain uses for twine and cordage. No person may sell or deliver binder or baler twine if he knows or has reason to believe that it is not to be used for the listed approved purposes, given in paragraph (a) (1) and (a) (13).

Will Recommend Paper Simplification

Simplification of weights and sizes of paper will be recommended to the War Production Board, the joint committee on Government relations of the commercial printing industry announced on December 13.

The simplification plan proposed would result in a universal saving of 5% in weight of all paper now being used, explained James F. Newcomb, of New York, and Edwin Lennox, of Chicago, committee co-chairmen.

Paper makers, paper merchants and printers met in Pittsburgh, Pa. to approve the recommendation which they say will eliminate waste due to miscalculation, save manpower in estimating job printing and remove errors in weights and counts.

Principal speaker at the session was A. E. Giegengack, of Washington, Public Printer of the United States, who described efforts to reduce consumption of paper by the Government.

Mr. deVries Makes Correction

In reporting in part an address by Eli de Vries, the president of Parsons & Whittemore at Kalamazoo, Mich. on export trade in paper after the war it was stated in last week's issue of the PAPER TRADE JOURNAL that Mr. de Vries said: "The grant of export premiums which prevailed in Germany and the Scandinavian countries must and will be prohibited by international law."

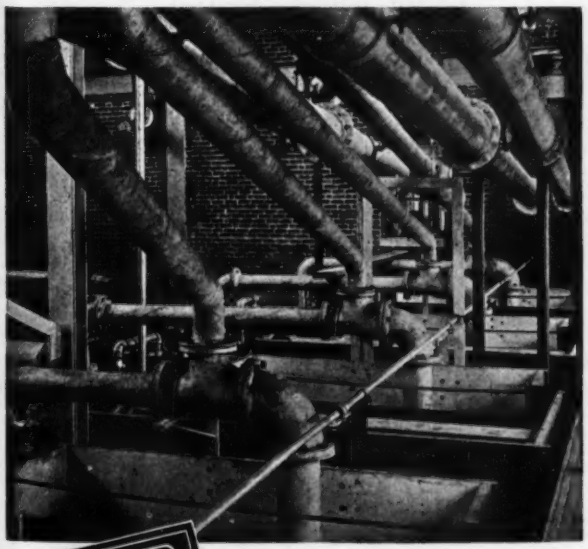
Mr. de Vries writes that the word "Scandinavian" was deleted from the prepared copy of his address and the fact that it appeared in the printed report was, of course, due to an unfortunate error.

PIPE REPAIR JOBS GO IN FASTER THIS WAY

When you are doing repair or replacement work on plant piping you can be sure of a good, fast, economical job by using ARMCO Spiral Welded Pipe.

Every foot of "Spiral Welded" is prefabricated to fit your layout. This means that even the most intricate assemblies slip into place quickly and accurately. Fewer flanges and fewer joints are the rule because fittings come welded to straight pipe runs. And ARMCO Pipe is smooth inside for high flow capacity—easy to keep clean too. The fewer joints reduce the possibility of leakage.

Learn how ARMCO Spiral Welded Pipe can expedite your wartime maintenance work. Diameters range from 6 to 36 inches; wall thicknesses from 7/64 to 1/2 inch. This wide selection plus the flexible design of the pipe enables you to fit it perfectly into almost every layout. Write us regarding your specific piping problems. The American Rolling Mill Company, Pipe Sales Div., 2311 Curtis St., Middletown, O.



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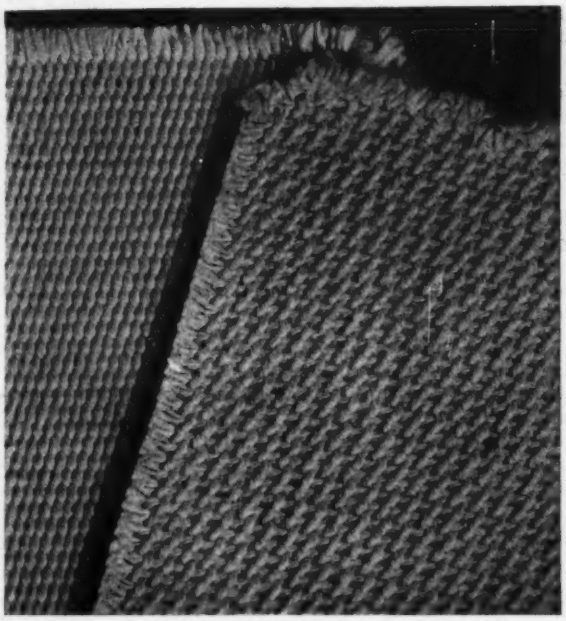
BRANDON DRYER FELTS



Manufactured from the raw cotton to the finished felt

BRANDON EXTRA

TRI-UMPH all cotton, 3 ply 53 oz., widths up to 250".

ZEPHYR all cotton, 3 ply 45 oz., widths up to 196".

ZEPHYR cotton-asbestos 3 ply Face 50% asbestos, back open construction for high porosity. Widths up to 166".

HINDLE S/54 all cotton special weave. Extra heavy duty Preshrunk, high porosity, widths up to 170".

SCAPA-HALL S/46 and S/46A. Available after VICTORY.

Sole Sales Agents

WOODWARD, BALDWIN & CO.

117 W. Baltimore St.

Baltimore, 1, Md.

Representatives:

J. S. Harrington, Watertown, N. Y.
C. B. Smith, Kalamazoo, Mich.
Christian Co., Richmond, Va.
D. H. White, Standard Supply Co., New Orleans
Frank P. Wilder, Portland, Ore.

MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL.
Wednesday, December 15, 1943.

BLANC FIXE—Current reports indicate no important change in the market for blanc fixe. Prices are firm. The current quotation is $40 per ton for the pulp, in barrels, at works. The powder is quoted at $60 per ton, f.o.b., works.

BLEACHING POWDER—Demand for bleaching powder continues active with prices unchanged. Current quotations range from $2.50 to $3.10 per 100 pounds, in drums, car lots, at works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24½ cents per pound; less than 2,000, 24¾ cents per pound, f.o.b., shipping point. Imported, 11½ cents per pound, f.o.b., source.

CAUSTIC SODA—Demand for caustic soda continues to be reported as very heavy. No reserve stocks are being accumulated. Quotations are firm and unchanged. The current quotation on solid caustic soda is $2.30 per 100 pounds; flake and ground are quoted at $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay continue unchanged. Domestic filled clay is quoted at from $7.50 to $15 per ton; coating clay at from $12 to $22 per ton, at mines. Imported china clay is quoted at from $13 to $25 per long ton, ship side.

CHLORINE—A short supply situation is again reported this week. Quotations are unchanged. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—Quotations on some grades of rosin are higher this week. "G" gum rosin is currently quoted at $4.03 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $4.00 per 100 pounds, in barrels, New York. Seventy per cent gum rosin size is quoted at $4.22 per 100 pounds, f.o.b., works.

SALT CAKE—The market for salt cake is reported unchanged. Demand continues moderate. Domestic salt cake is currently quoted at $15 per ton, in bulk; chrome cake is quoted at $16 per ton. All prices in car lots, f.o.b. shipping point.

SODA ASH—The market for soda ash continues tight. Demand is reported in excess of supply. Quotations are firm and conform to prevailing prices. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—No change in the tight supply situation of corn and its products is reported at this date. Prices are unchanged. Pearl is currently quoted at $3.10 per 100 pounds; powdered starch at $3.20 per 100 pounds; all prices in bags, car lots, f.o.b. Chicago.

SULPHUR — Demand for sulphur continues heavy in the market situation of sulphate of alumina has been reported this week. The commercial grades are quoted at from $1.15 to $1.25 per 100 pounds; iron free is quoted at $2.35 per 100 pounds. All prices in bags, car lots, f.o.b., works.

SULPHUR — Demand for sulphur continues heavy. Quotations continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. The current contract quotation at Gulf Ports is $17.50 per long ton.

TALC—Prices on talc are unchanged and continue to conform to prevailing market levels. Domestic talc is currently quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

News, per ton—			
Roll, contract...	*$58.00	@	—
Sheets	64.00	"	—
* OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	*$5.25	@	—
No. 1 Wrapping...	*5.00	"	—
Standard Wrapping	*4.75	"	—
Standard Bag.....	*4.375	"	—
* OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1.....	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½....	1.00	"	—
White No. 2.....	.90	"	—
Anti-Tarnish M.F..	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet...	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.....	2.60	"	—
Bleached, Jr.....	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute.....	11.25	@	—
No. 1 Manila Wrapping, 35 lb.....	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.....	5.75	"	6.00
Boards, per ton—			
News	*48.00	@	—
Chip	*48.00	"	—
Sgl. Mla. Lt. Chip	*60.00	"	—
White Pat. Coated	*75.00	"	—
Kraft Liners 50 lb.	*63.00	"	—
Binders Boards....	84.00	"	116.00

* OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10	@$46.00	$40.25@$47.25
100% Rag	32.20 "	37.75	33.35 " 39.25
85% Rag	.... "	....	29.90 " 35.00
75% Rag	23.00 "	27.00	24.15 " 28.25
65% Rag	.... "	....	22.80 " 27.75
50% Rag	18.70 "	22.75	19.90 " 24.25
25% Rag	16.40 "	20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1..	$10.55	@$12.75	$11.70@$14.25
No. 2..	9.65 "	11.75	10.80 " 13.25
No. 3..	9.20 "	11.25	10.35 " 12.50
No. 4..	8.90 "	10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Papers. Delivered in Zone 1:

No. 1 Glossy Coated...	$13.65	@	$15.5
No. 2 Glossy Coated...	12.40	"	14.0
No. 3 Glossy Coated...	11.60	"	13.2
No. 4 Glossy Coated...	11.15	"	12.7
No. 1 Antique (watermarked)	10.25	"	11.7
No. 2 Offset.....	9.60	"	11.0
A Grade E. F.....	9.35	"	10.7
A Grade S. & S. C....	9.60	"	11.0
B Grade E. F.....	8.85	"	10.2
B Grade S. & S. C....	9.10	"	10.5
C Grade E. F.....	8.55	"	9.7
C Grade S. & S. C....	8.80	"	10.0
D Grade E. F.....	8.25	"	9.5
D Grade S. & S. C....	8.50	"	9.7

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight, Not Exceeding OPA Allowances.

Bl. Softwood Sulphite.....	$76.0		
Unbl. Softwood Sulphite.	65.00	@	66.0
Bl. Hardwood Sulphite.....			73.5
Unbl. Hardwood Sulphite....			63.5
Bl. Mitscherlich.....			81.0
Unbl. Mitscherlich ...	72.00	@	82.0
N. Bleached Sulphate.....			86.0
S. Bleached Sulphate.....			79.0
N. Semi-Bleached Sulphate...			82.0
S. Semi-Bleached Sulphate....			75.0
N. Unbl. Sulphate.....			73.0
S. Unbl. Sulphate.....			63.5
Bl. Soda			66.0
Unbl. Soda			62.0
Groundwood			46.0

Transportation Allowances Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area).....	10.50
West Coast (out area).....	16.50

	50%-80% Air Dry Weight
Northeast	$11.50
Lake Central	11.50
Southern	14.00
West Coast (in area).....	9.50
West Coast (out area).....	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.5
Lake Central	8.50
Southern	11.0
West Coast (in area).....	7.50
West Coast (out area).....	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

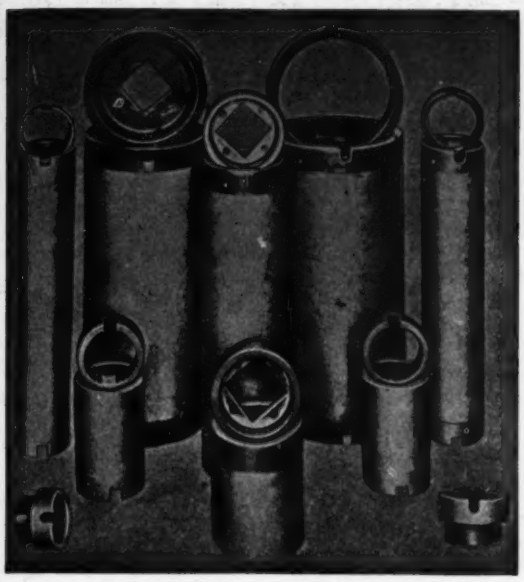
Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1..	6.50	@	7.25*
Silesias No. 1... ...	—	"	5.75*
New Unbleached...	6.75	"	7.50*
Blue Overall.....	—	"	5.50*
Fancy	—	"	3.50*
Washables	—	"	3.00*
Bleached Khaki Cuttings	—	"	4.25*
Unbleached Khaki Cuttings	—	"	3.50*

* OPA Maximum Prices.



ELIXMAN

CAPS

Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with re enforced square hole. This patented feature of reenforcement gives added strength and durability.

CORES

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.

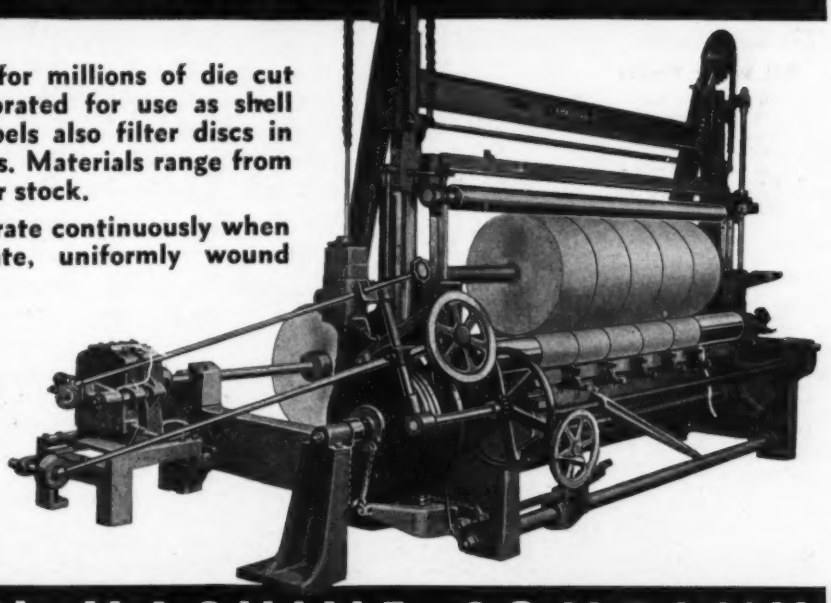
CORINTH, N. Y.

KEEP DIE PRESSES BUSY with CAMERON-WOUND ROLLS

The war effort calls for millions of die cut discs, plain and perforated for use as shell primer discs, tags, labels also filter discs in airplane gasoline filters. Materials range from onion skin to felt paper stock.

Die punch presses operate continuously when supplied with accurate, uniformly wound Cameron rolls.

One Camachine keeps 26 die punch presses busy, so if you are being pressed to deliver war orders, use a Camachine to speed production.



CAMERON MACHINE COMPANY

61 POPLAR STREET, BROOKLYN 2, N. Y. MIDWEST OFFICE 111 WEST MONROE STREET, CHICAGO 3

Old Rags

White, No. 1—			
Repacked	*3.80	"	—
Miscellaneous	*3.20	"	—
White, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
Third and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
Roofing Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	●	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	4.25	●	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

* OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	●	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Mixed Books	.85	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Mixed Ledger, colored	1.87½	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.85	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overisaue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	.85	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	●	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.19	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila		"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White No. 1	.07¼	●	.07½
New White No. 2	.04½	"	.05
Light Silesias	.04½	"	.04¾
Silesias, No. 1	.04	"	.04¼
Black Silesias, soft	.03¼	"	.04
New Unbleached	.07¼	"	.07½
Washable Prints	.03¼	"	.03½
Washable No. 1	.02	"	.02¼
Blue Overall	.04½	"	.05½
Cottons—According to grades—			
Washable shredding	—	"	.01¾
Fancy Percales	.03¼	"	.03½
New Black Soft	.02¾	"	.03
New Dark Seconds	1.75	"	2.00
Khaki Cuttings—			
No. 1 O. D.	.03	"	.03¼
No. 2 Mixed	.02¼	"	.02½
Corduroy	.01¾	"	.02¼
New Canvas	.04¾	"	.05¼
New Black Mixed	—	"	.02½

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
White No. 2—Repacked	2.90	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	5.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.50
Sisal Rope	3.75	"	—
Mixed	1.00	"	1.50
Scrap—			
No. 1	3.25	"	3.50
No. 2	1.75	"	1.80
Wool Tares	4.00	"	4.25
No. 1 New Lap			
Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings, Misc.	2.13	"	—
No. 1 White Ledger	2.17½	"	—
No. 2 Ledger, colored	1.87½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Box Board Cuttings	.72½	"	—
Ksaft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.15	"	—
Overissue News	.85	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices

No. 1 Hard White Shavings, unruled	2.87½	●	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.70	"	—
Overissue News	.85	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.15	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	2.50	●	2.75
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	1.35	"	1.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Carpet Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	3.25	"	3.50
Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	—
Aust. Wool Pouches	3.75	"	4.00
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Bagging	1.35	"	—

* OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04½	●	.04¾
Fancy Percales	.04¼	"	.05
New White No 1	.06¾	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06¼
Underwear Cutters, Bleached	.06¼	"	.06¾
Underwear Cutters, Unbleached	.05¾	"	.06
Silesias No. 1	.06	"	.06¼
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06½	"	.06¾
Blue Cheviots	.05½	"	.06
Fancy	.02¾	"	—
Washable	.02¾	"	—
Khaki Cuttings	.02¾	"	.03
O. D. Khaki	.03½	"	.03¾
Corduroy	.03¾	"	.03½
New Canvas	.06¼	"	.06¾
B. V. D. Cuttings	.06¼	"	.06¾

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	●	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	—
No. 2	1.45	"	—
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A	1.35	"	—
Quality B	1.20	"	—
Quality C	.95	"	—
Old Manila Rope	5.75	"	—

* OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices.

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	1.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.17½	"	—
No. 1 Heavy Books & Magazines	1.67½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	.85	"	—
No. 1 News	.75	"	—
No. 1 Mixed Paper	.70	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—